Recommendations for a Report to the Governor

Commission on the Future of Higher Education in Missouri

November 10, 2003

R. Crosby Kemper III, Chairman

The Governor's Charge

- **Training the workforce for the global economy**
- **The centrality of the liberal arts**
- **Creating centers of excellence**

The Framework

- **The National Collaborative**
  - **The Education Commission of the States**
  - **The National Center of Higher Education Management Systems (NCHEMS)**
  - **National Center for Public Policy and Higher Education**
  - **Missouri Department of Higher Education**
- **Measuring Up**

Measuring Up

- **Preparation**
- **Completion**
- **Participation**
- **Benefits**
- **Affordability**
- **Learning**

"Revolutionary…….report cards"

Then: US Higher Education proponents cite "merits of particular elite institutions"

Now: "Our higher education system….is not meeting….diverse needs"

9 Strategies for Initiatives - 9 Initiatives for Strategies

One of the first rules of life: Beware any formulation that sounds the same backwards - our initiatives should be specific and concrete

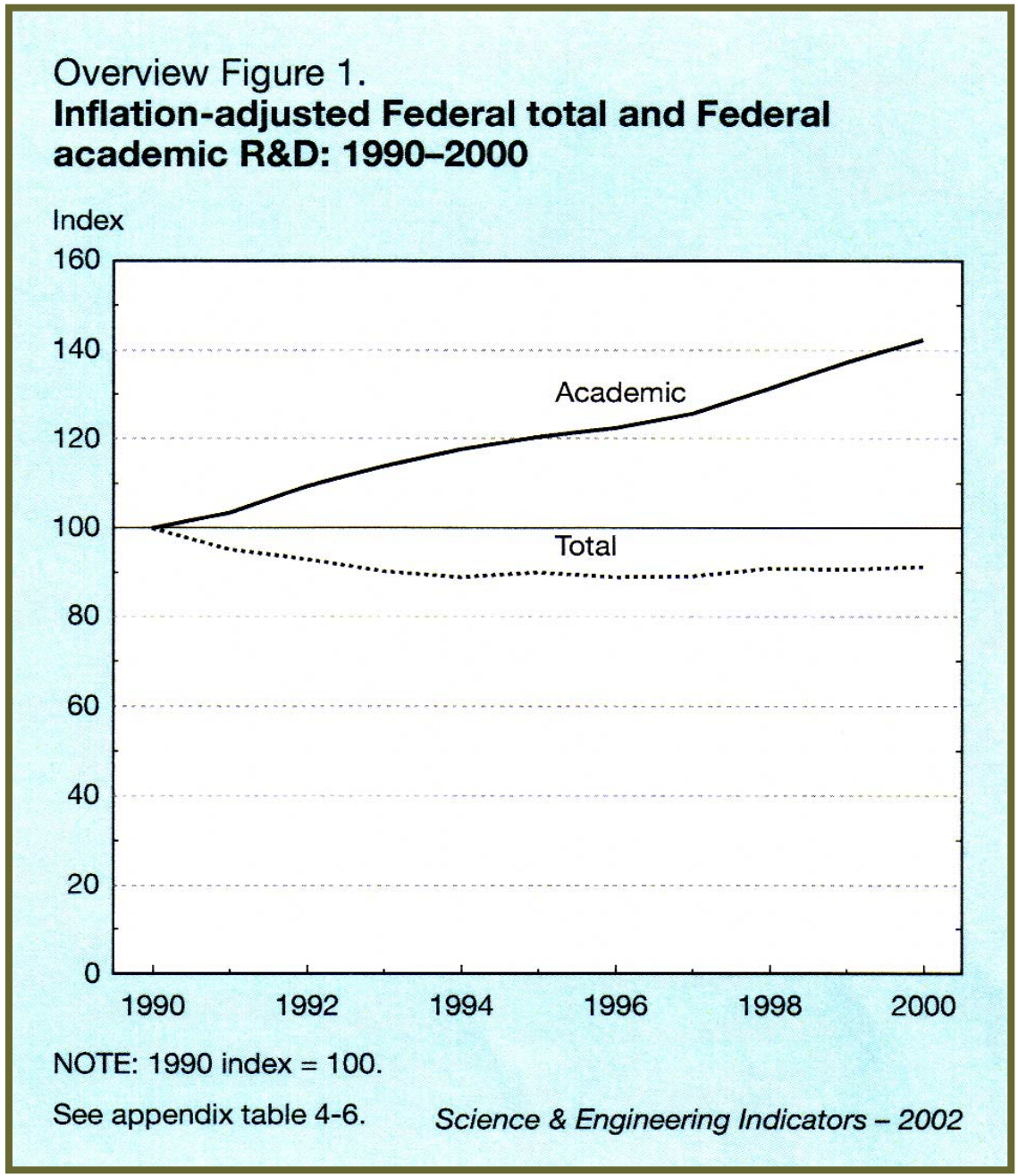
What Are They Worried About?

- **40% of job applicants lack *workplace skills***
- **The shortage of IT workers (Hint: it's over; a warning against worrying too much over specific economic events or cycles) (*p. 6 Business Leaders Guide)***
- **Global competition**
  - **Norway, Great Britain, and the Netherlands have surpassed the U.S. in proportion of population graduating college**
  - **Engineering comparison (*p. 7 Business Leaders Guide)***
    - **5% of degrees in US are in engineering**
    - **21% in Germany**
    - **46% in China !!! (competition or obsession?)**
  - **Engineering and Science will be something of a theme, so let's look at it globally**

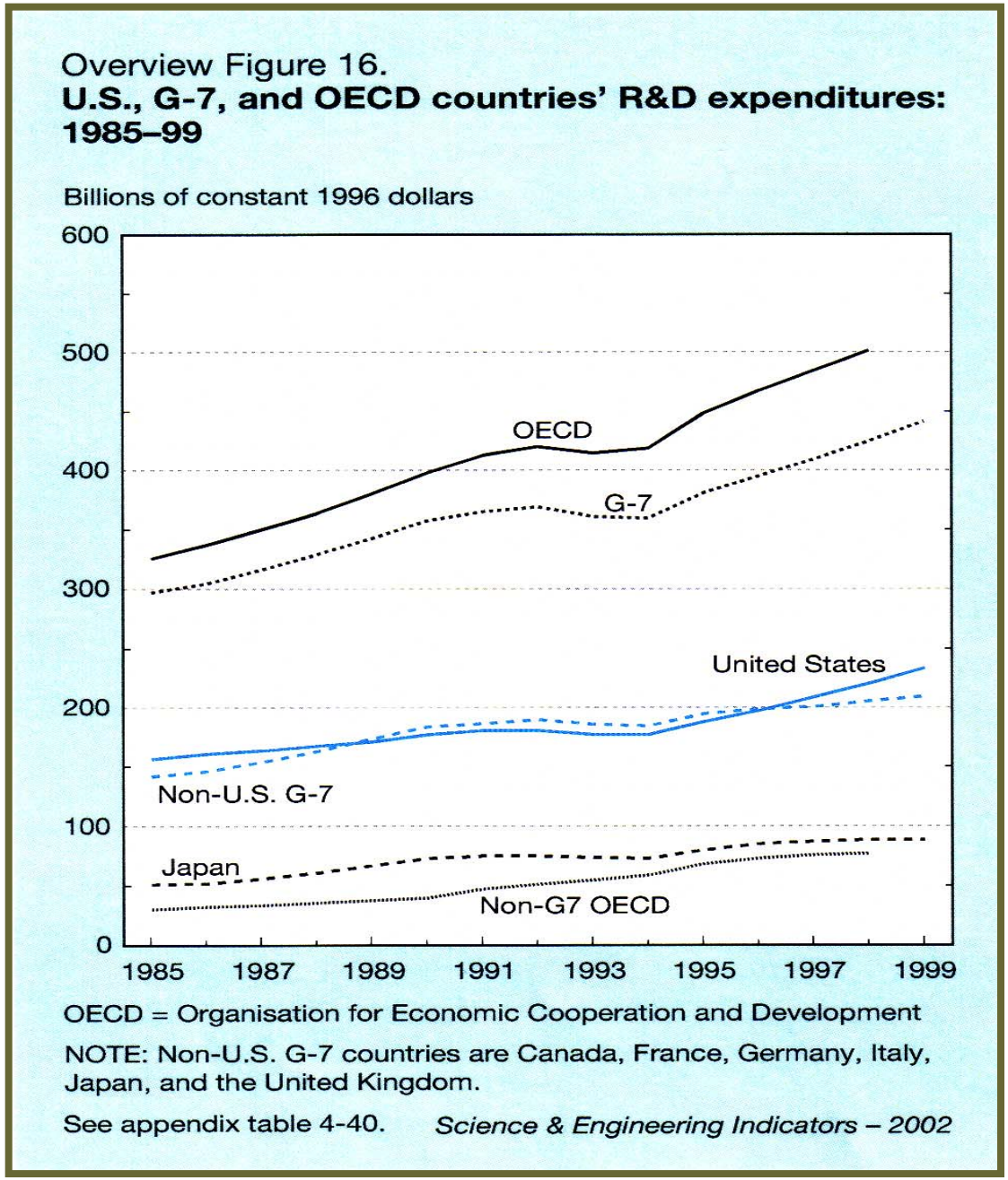
Are We Spending Money?

- **YES: U.S. R&D expenditures = the combined expenditures of Japan, Germany, Canada, France, Italy, and the U.K.** ***(see graphs fig 1 p. O-2, fig 16 p. O-12 National Science Foundation's Science & Engineering Indicators 2002)***
  Recurring theme - to kill the suspense, the answer is always YES
- **Do we get results? YES**
  - **Patents granted to U.S. universities are up 600%+ in the last 20 years** ***(fig 3 p. O-3)***
  - **We are holding market share in the new economy (While our market share swings up and down, it is the same as it was in 1980!! And we continue to lead the world in exports.)** ***(fig 11 p. O-9)***
  - **BUT it is *absolutely true* we are not graduating many folks in science or engineering. Almost everybody is ahead of U.S., even the Irish and the Spanish! Interestingly, the Swiss and the Belgians are not.** ***(fig 4 p. O-3)***
- **Why (and Where) are we spending so much money?**
  - **We are granting Ph.D.'s increasingly to those foreign born**
  - **<u>and</u> employing foreign educated Ph.D.'s**
    (fig 5 p. O-4, fig 7 p. O-6, fig 8,9 p. O-7)

Inflation-adjusted Federal total and Federal academic R&D 1990-2000

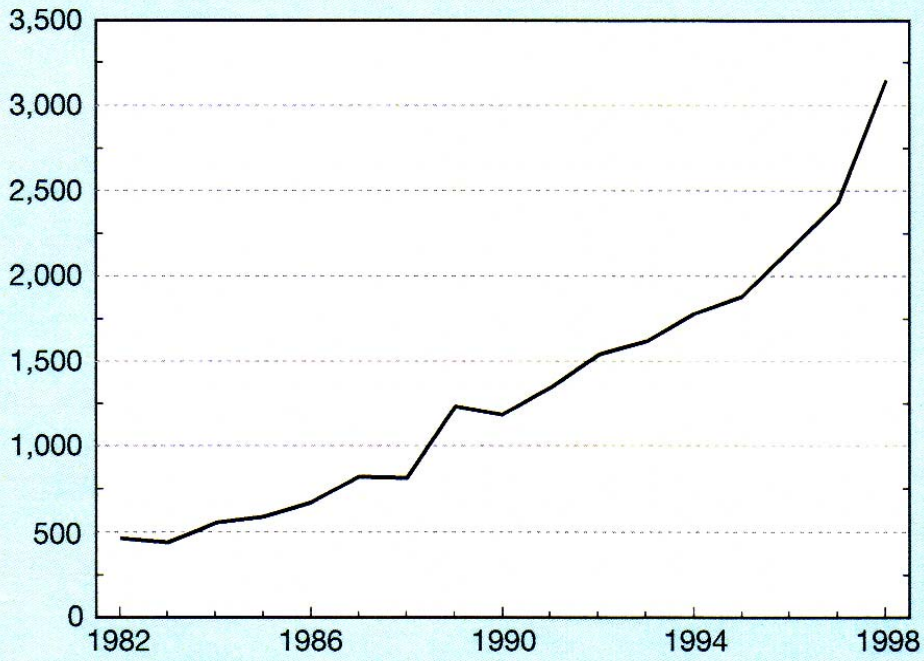


U.S., G-7, and OECD countries R&D expenditures: 1985-1999 (U.S. = entire G7 expenditure)



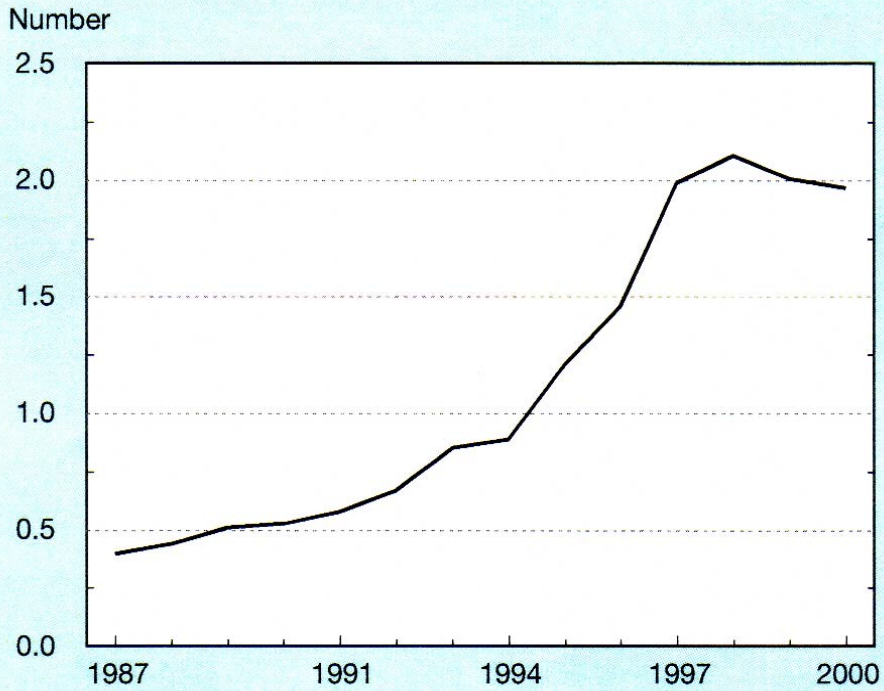
Patents granted to U.S. Universities 1982-98

Overview Figure 3.
Patents granted to U.S. universities: 1982–98



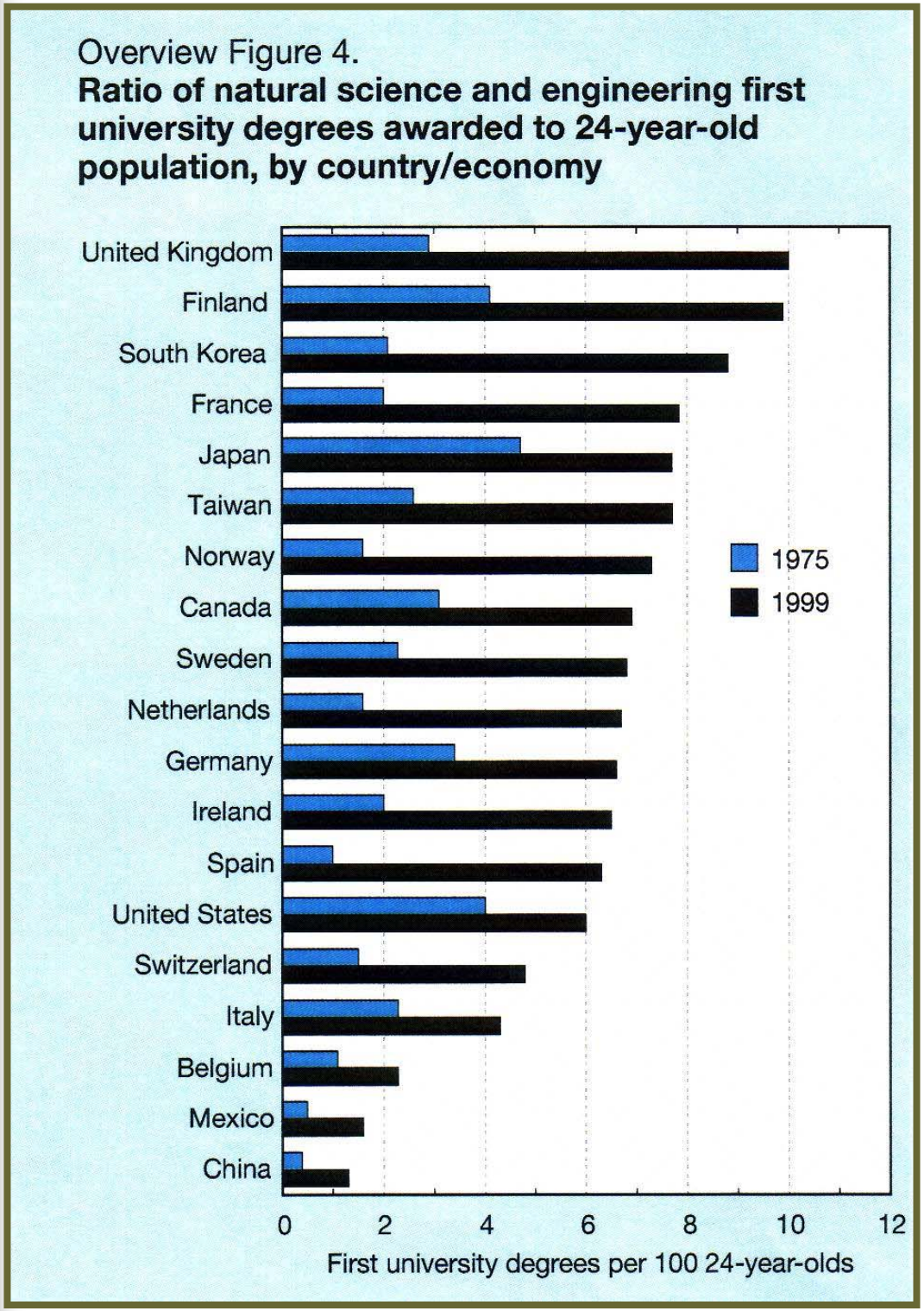
Average number of citations to scientific and technical articles per U.S. Patent 1987-2000

Average number of citations to scientific and technical articles per U.S. patent: 1987–2000



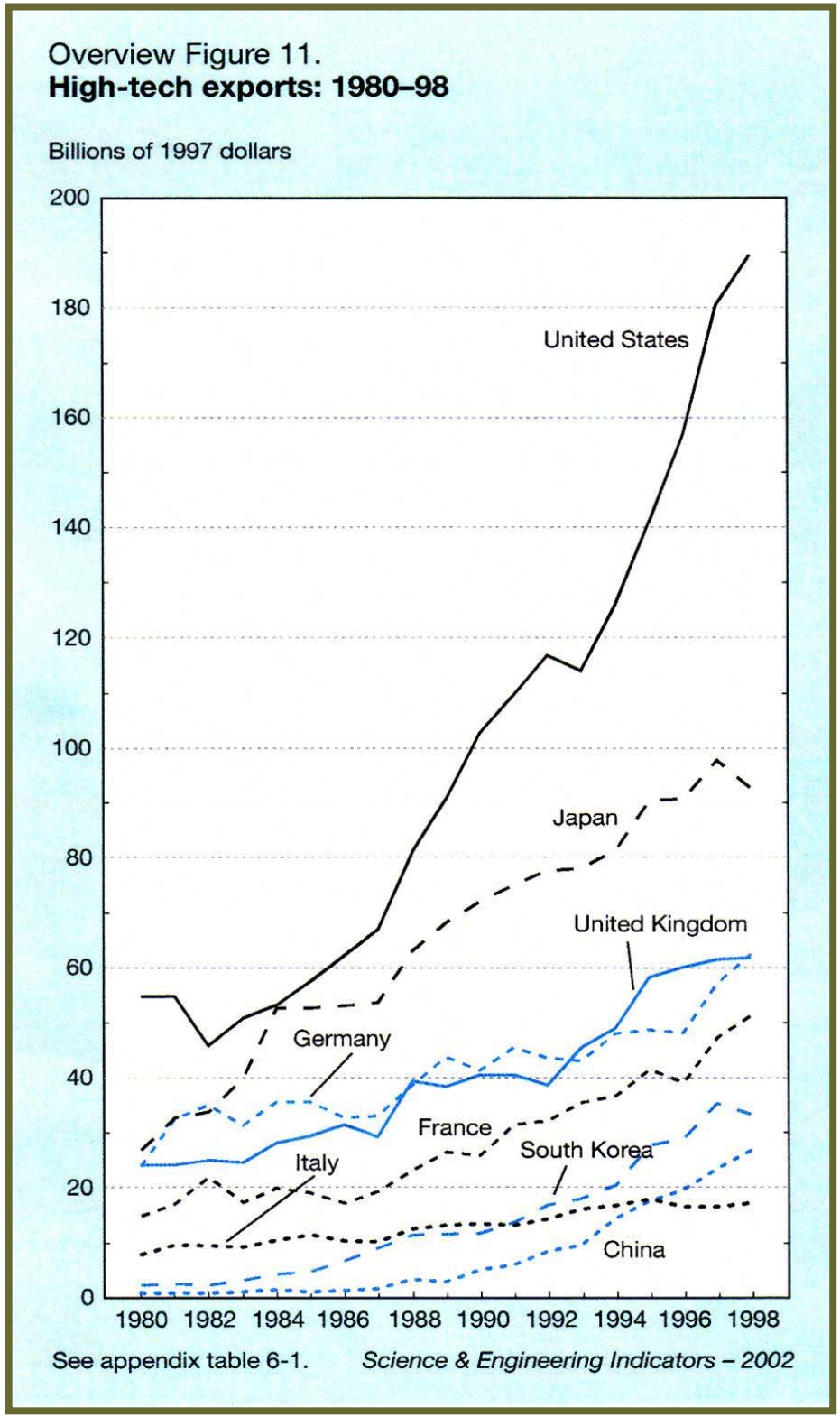
See appendix tables 5-54 and 5-56.

Science & Engineering Indicators – 2002



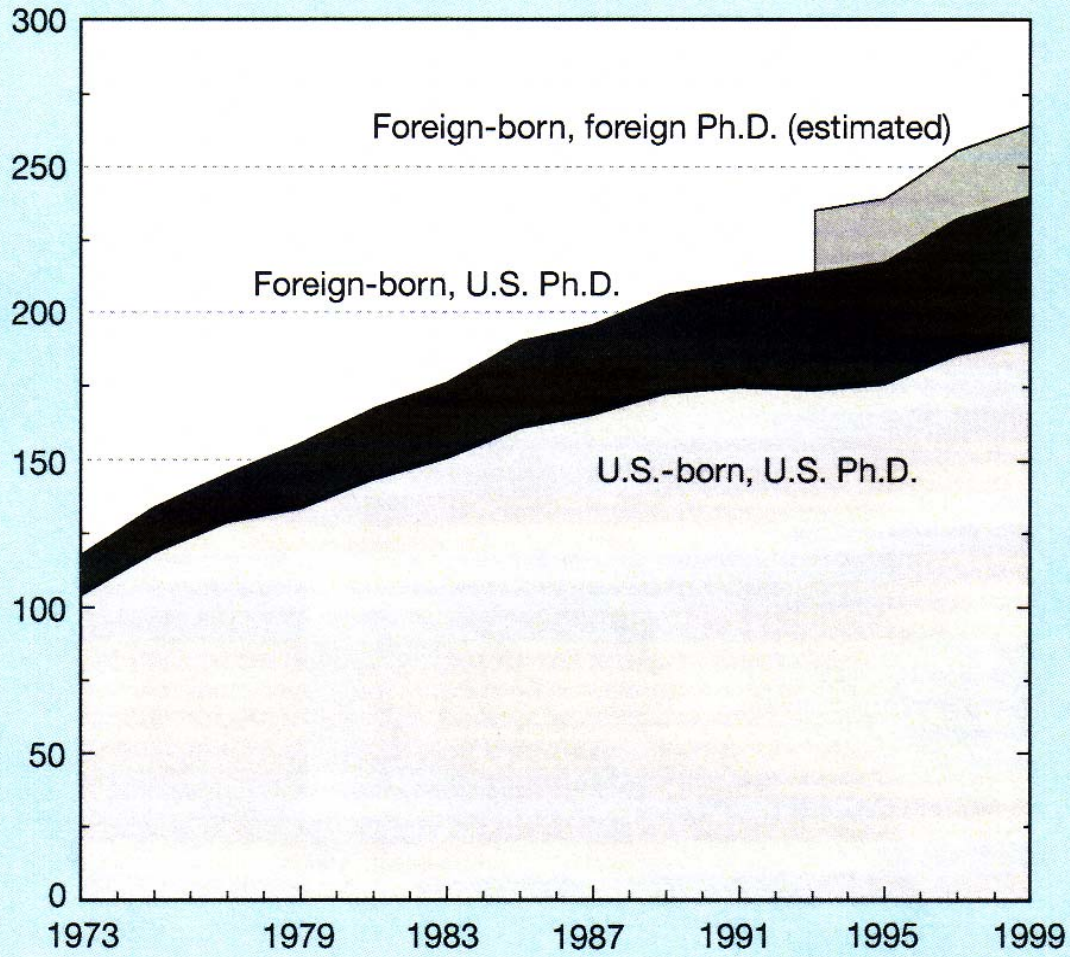
Ratio of natural science and engineering first university degrees awarded to 24-year-old population by country/economy

High-tech exports: 1980-98



Overview Figure 5.

Academic employment of native and foreign-born doctoral scientists and engineers: 1973–99

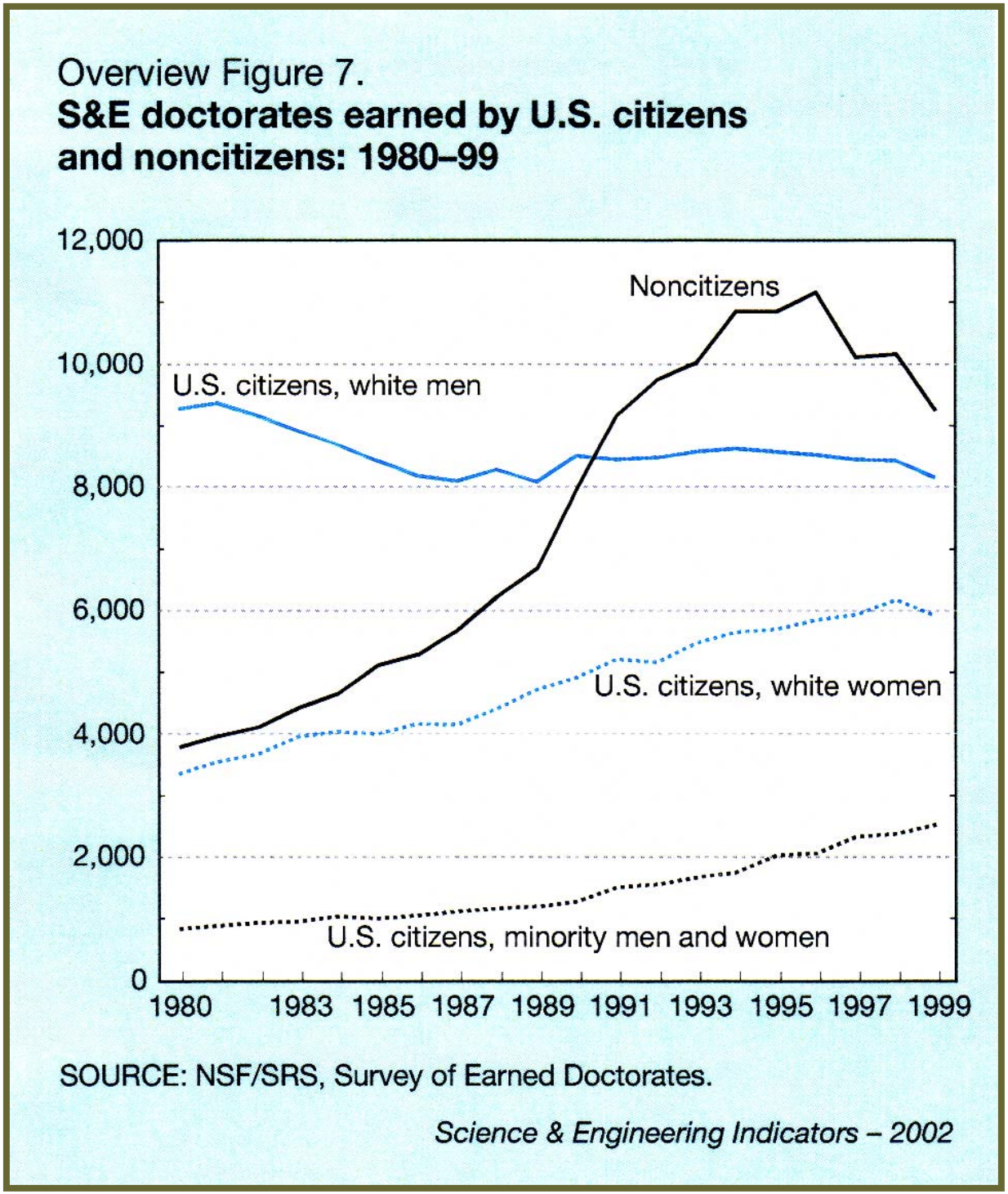


NOTE: Data on foreign-born foreign-earned Ph.D.s unavailable before 1993.

See text table 5-6. *Science & Engineering Indicators – 2002*

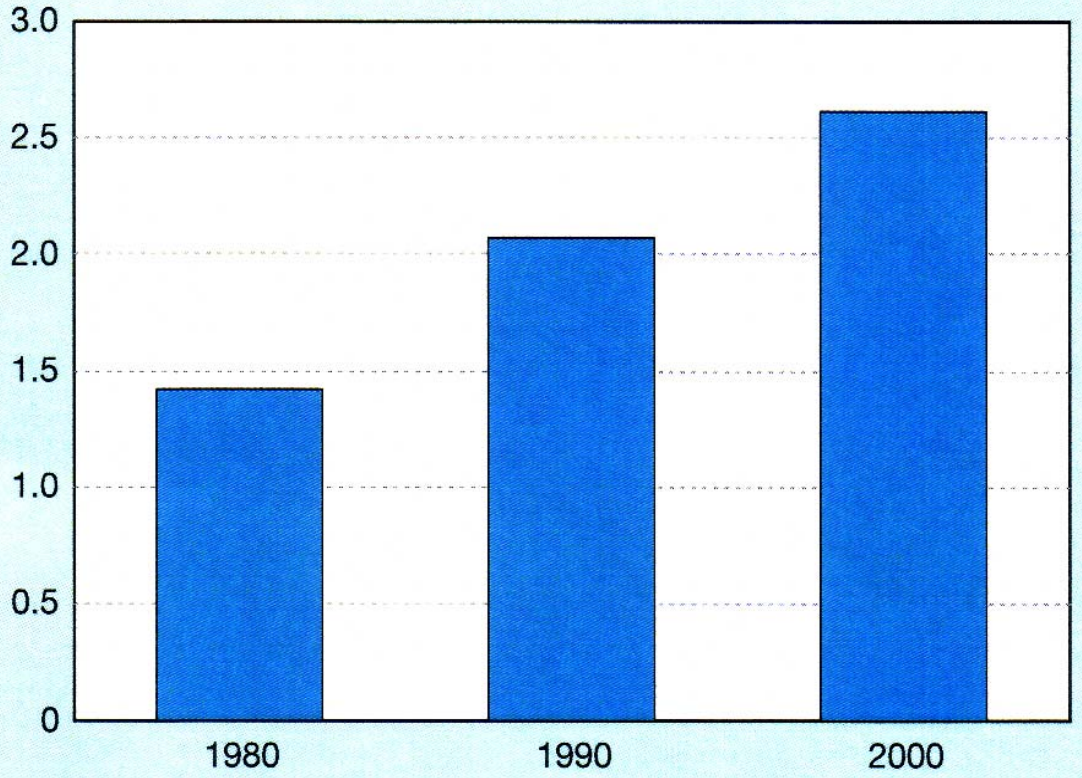
Academic employment of native and foreign-born doctoral scientists and engineers: 1973-99

S&E doctorates earned by U.S. citizens and noncitizens 1980-99



Employment by S&E occupations as percentage of total civilian employment 1980-99

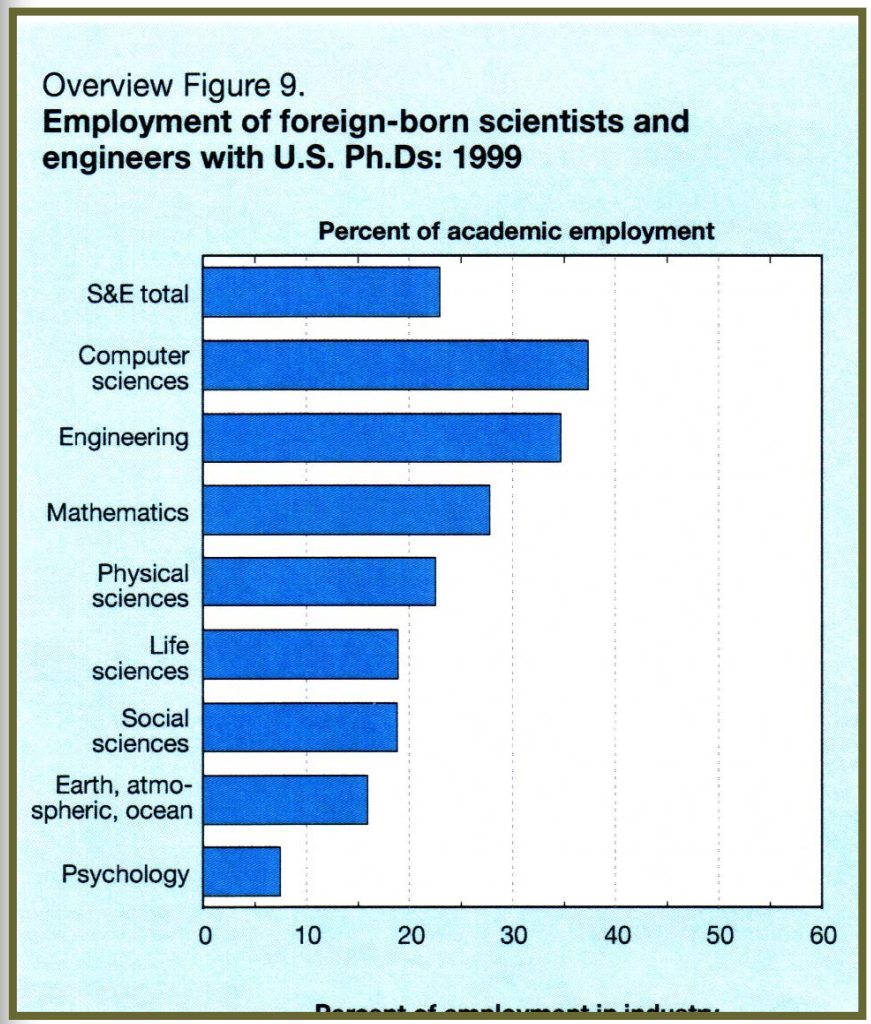
Overview Figure 8.
Employment in S&E occupations as percentage of total civilian employment

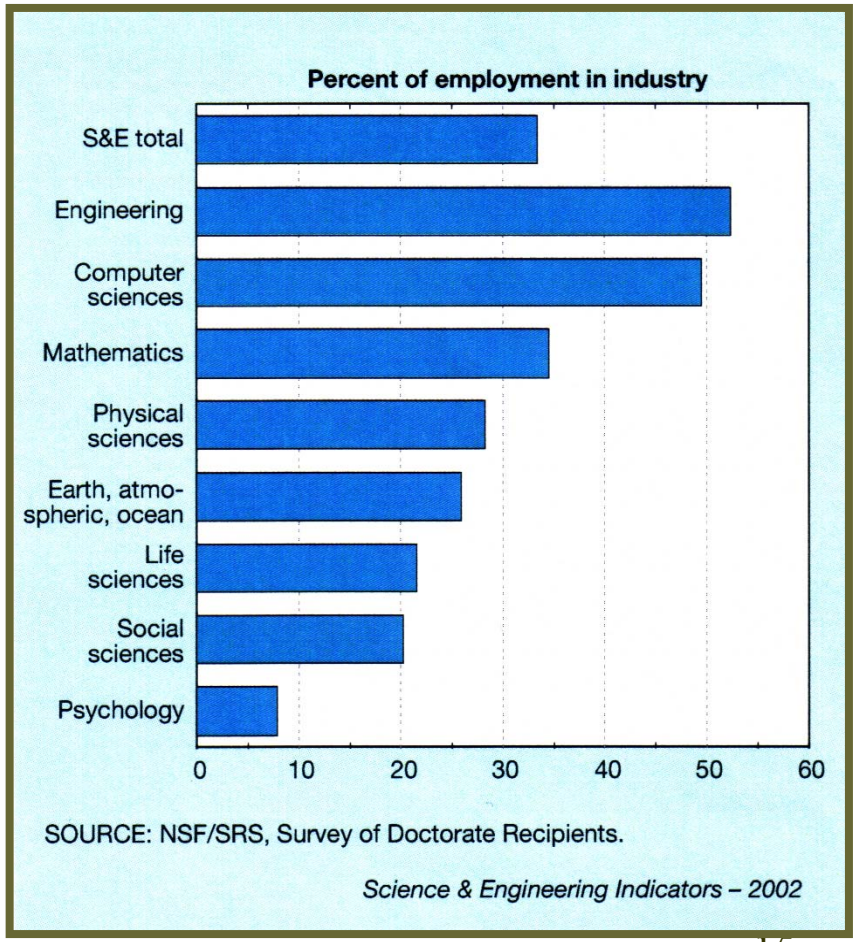


SOURCE: U.S. Bureau of the Census, Public Use Micro Data Sample (1980, 1990); Current Population Survey (2000).

Science & Engineering Indicators – 2002

Employment of foreign-born scientists and engineers with U.S. PhDs: 1999



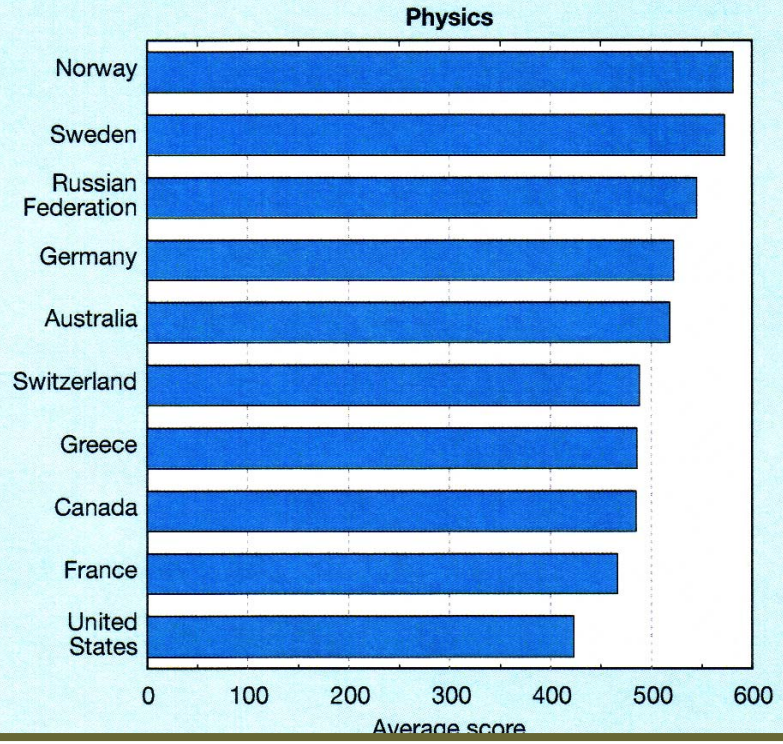


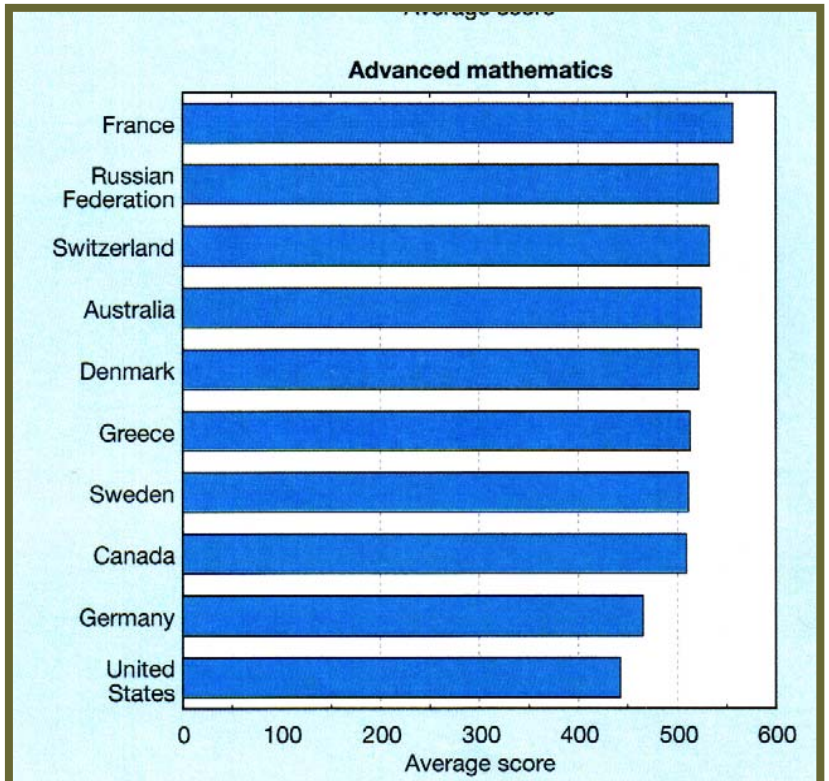
What's Going On?

- **Another theme--It's not the money**
- **It's the performance and the content, or the failure of preparation**
  - **The performance of students in the last year of high school**
    - **In physics - U.S. is *last***
    - **in advanced math - U.S. is *last* *(graph fig 6 p. O-5)***
  - **These *are* the *prerequisites* for college science and engineering majors**
- **Is it socio-economic background, family decline, basic aptitude, spending per pupil, class size, heredity, racial background, or too much TV?**
  - **If it were any of these we would see it reflected in our performance at all levels of education**

Performance of students in last year of high school: 1994-95

Overview Figure 6.
Performance of students in last year of high school: 1994–95





NOTE: U.S. score in physics is significantly lower than all other countries listed, and lower than all but Germany for advanced mathematics.

SOURCE: Mullis, I., et al., 1998. Mathematics and Science Achievement in the Final Year of Secondary School. Boston, MA, Boston College, TIMSS International Study Center.

Science & Engineering Indicators – 2002

How Big is the Problem?

- **The US vs. OECD**
  - **Industrialized countries**
  - **G-8—the big economies**
- **Missouri vs. the U.S.**

U.S. vs. OECD

- **In *4th* grade *Math* U.S. is *#7***
  - **Behind Japan and Korea**
  - **Ahead of Canada, the U.K., Norway, and the Netherlands *(IEA's TIMSS 1994-95 table 1.1)***
- **In *8th* grade *Math* U.S. is *#19***
  - **Behind Latvia, Bulgaria, Malaysia, Slovenia, and the Slovak Republic**
  - **Ahead of the U.K., Israel, and Italy**
- **In *8th* grade *Science* U.S. is *#18***
  - **Behind Bulgaria (again!), Slovak Republic, and Slovenia**
  - **But we did beat the Latvians!**
    (IEA's TIMSS 1999 tables 398 & 400)

U.S. vs. OECD (continued)

- **Comparison of 15-year-olds**
  - **Math-U.S. is 20th**
    (chart A6.1 Education at a Glance OECD 2003)
  - **Science-U.S. is 14th**
    (chart A6.2)
  - **Reading-the same thing**
    - **The U.S. is #5 among 4th graders**
      (chart A4.3)
    - **We drop to #15 among 15-year-olds**
      (chart A5.1)

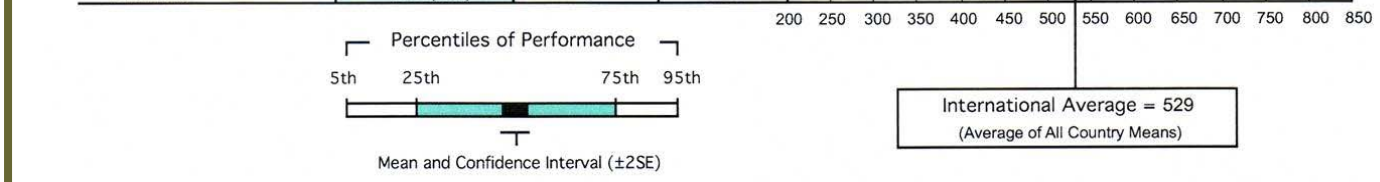
U.S. declines over the school career more than any other country

Distributions of Mathematics Achievement-Upper Grade

Table 1.1

Distributions of Mathematics Achievement - Upper Grade (Fourth Grade*)

Country	Mean	Years of Formal Schooling	Average Age	Mathematics Achievement Scale Score
Singapore	625 (5.3)	4	10.3	
Korea	611 (2.1)	4	10.3	
Japan	597 (2.1)	4	10.4	
Hong Kong	587 (4.3)	4	10.1	
Czech Republic	567 (3.3)	4	10.4	
Ireland	550 (3.4)	4	10.3	
United States	545 (3.0)	4	10.2	
Canada	532 (3.3)	4	10.0	
† Scotland	520 (3.9)	5	9.7	
†2 England	513 (3.2)	5	10.0	
Cyprus	502 (3.1)	4	9.8	
Norway	502 (3.0)	3	9.9	
New Zealand	499 (4.3)	4.5–5.5	10.0	
Greece	492 (4.4)	4	9.6	
Portugal	475 (3.5)	4	10.4	
Iceland	474 (2.7)	4	9.6	
Iran, Islamic Rep.	429 (4.0)	4	10.5	
Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A for Details):				
Australia	546 (3.1)	4 or 5	10.2	
Austria	559 (3.1)	4	10.5	
1 Latvia (LSS)	525 (4.8)	4	10.5	
Netherlands	577 (3.4)	4	10.3	
Countries Not Meeting Age/Grade Specifications (High Percentage of Older Students; See Appendix A for Details):				
Slovenia	552 (3.2)	4	10.9	
Countries With Unapproved Sampling Procedures at Classroom Level (See Appendix A for Details):				
Hungary	548 (3.7)	4	10.4	
Unapproved Sampling Procedures at Classroom Level and Not Meeting Other Guidelines (See Appendix A for Details):				
1 Israel	531 (3.5)	4	10.0	
Kuwait	400 (2.8)	5	10.8	
Thailand	490 (4.7)	4	10.5	



Average 8th grade math scores by content and studying

Table 398.—Average 8th-grade mathematics scores by content areas, and average time spent studying out of school, by country: 1999

Country	Average achievement scale score						Distribution of daily out-of-school study time in mathematics, with mean mathematics scores					
	Mathematics overall	Fractions and number sense	Geometry	Algebra	Data representation, analysis and probability	Measurement	No time		Less than 1 hour		One hour or more	
							Percent	Mean score	Percent	Mean score	Percent	Mean score
1	2	3	4	5	6	7	8	9	10	11	12	13
International average [1]	**487 (0.7)**	**487 (0.7)**	**487 (0.7)**	**487 (0.7)**	**487 (0.7)**	**487 (0.7)**	**10 (0.1)**	**455 (1.7)**	**50 (0.2)**	**495 (0.8)**	**40 (0.2)**	**486 (0.9)**
Australia	525 (4.8)	519 (4.3)	497 (5.7)	520 (5.1)	522 (6.3)	529 (4.9)	15 (1.0)	493 (6.3)	63 (1.1)	537 (5.0)	22 (1.0)	515 (6.3)
Belgium (Flemish)	558 (3.3)	557 (3.1)	535 (4.1)	540 (4.6)	544 (3.8)	549 (4.0)	3 (0.8)	476 (21.8)	50 (1.0)	573 (3.8)	47 (1.2)	550 (3.1)
Bulgaria	511 (5.8)	503 (6.6)	524 (5.9)	512 (5.1)	493 (6.1)	497 (6.6)	12 (1.2)	494 (9.5)	45 (1.3)	516 (5.5)	43 (1.7)	521 (7.9)
Canada	531 (2.5)	533 (2.5)	507 (4.7)	525 (2.4)	521 (4.5)	521 (2.4)	11 (0.8)	527 (5.2)	61 (1.0)	542 (2.8)	28 (1.0)	510 (3.3)
Chile	392 (4.4)	403 (4.9)	412 (5.4)	399 (4.3)	429 (3.8)	412 (4.9)	17 (0.8)	384 (5.9)	54 (0.7)	400 (4.7)	29 (1.0)	394 (7.1)
Chinese Taipei	585 (4.0)	576 (4.2)	557 (5.8)	586 (4.4)	559 (5.1)	566 (3.4)	31 (1.3)	529 (4.8)	44 (0.8)	604 (3.5)	25 (1.0)	627 (4.7)
Cyprus	476 (1.8)	481 (3.0)	484 (4.6)	479 (1.6)	472 (4.6)	471 (4.0)	9 (0.6)	425 (7.2)	51 (1.1)	496 (2.7)	40 (1.1)	469 (2.4)
Czech Republic	520 (4.2)	507 (4.8)	513 (5.5)	514 (4.0)	513 (5.9)	535 (5.0)	12 (1.0)	525 (9.2)	68 (1.3)	528 (4.6)	20 (1.1)	493 (5.2)
England	496 (4.1)	497 (3.8)	471 (4.2)	498 (4.9)	506 (8.0)	507 (3.8)	— —	— —	— —	— —	— —	— —
Finland	520 (2.7)	531 (3.8)	494 (6.0)	498 (3.1)	525 (3.8)	521 (4.7)	7 (0.6)	506 (8.1)	85 (0.8)	525 (2.5)	8 (0.7)	486 (6.8)
Hong Kong	582 (4.3)	579 (4.5)	556 (4.9)	569 (4.5)	547 (5.4)	567 (5.8)	25 (1.2)	552 (6.1)	51 (0.9)	591 (3.9)	24 (1.1)	600 (4.8)
Hungary	532 (3.7)	526 (4.2)	489 (4.3)	536 (4.1)	520 (5.9)	538 (3.5)	4 (0.4)	497 (9.9)	71 (1.0)	540 (3.6)	25 (1.1)	514 (5.0)
Indonesia	403 (4.9)	406 (4.1)	441 (5.1)	424 (5.7)	423 (4.4)	395 (5.1)	10 (0.8)	396 (8.4)	38 (1.0)	405 (5.6)	51 (1.4)	406 (5.4)
Iran, Islamic Republic	422 (3.4)	437 (4.5)	447 (2.9)	434 (4.9)	430 (6.0)	401 (4.7)	3 (0.3)	375 (14.1)	22 (0.8)	425 (3.7)	75 (1.0)	427 (3.7)
Israel [2]	466 (3.9)	472 (4.4)	462 (5.4)	479 (4.5)	468 (5.1)	457 (5.1)	8 (0.6)	436 (11.3)	48 (1.1)	491 (4.2)	44 (1.4)	454 (4.3)
Italy	479 (3.8)	471 (5.0)	482 (5.6)	481 (3.6)	484 (4.5)	501 (5.0)	5 (0.5)	400 (9.5)	39 (1.2)	488 (4.5)	57 (1.3)	482 (4.0)
Japan	579 (1.7)	570 (2.6)	575 (5.1)	569 (3.3)	555 (2.3)	558 (2.4)	26 (1.2)	558 (3.8)	54 (0.9)	586 (2.0)	20 (0.9)	585 (2.5)
Jordan	428 (3.6)	432 (3.2)	449 (7.1)	439 (5.3)	436 (7.8)	438 (4.4)	8 (0.6)	374 (9.8)	33 (0.8)	441 (4.6)	60 (1.0)	445 (4.3)
Korea, Republic of	587 (2.0)	570 (2.7)	573 (3.9)	585 (2.7)	576 (4.2)	571 (2.8)	34 (1.0)	560 (2.6)	45 (0.7)	598 (2.0)	21 (0.9)	610 (4.1)
Latvia (Latvian-speaking schools) [2]	505 (3.4)	496 (3.7)	522 (5.6)	499 (4.3)	495 (4.8)	505 (3.5)	3 (0.4)	480 (13.8)	58 (1.3)	516 (4.1)	40 (1.3)	493 (4.1)
Lithuania [2]	482 (4.3)	479 (4.3)	496 (5.8)	487 (3.7)	493 (3.6)	467 (4.0)	3 (0.5)	417 (15.8)	68 (1.4)	486 (4.4)	29 (1.3)	483 (5.3)
Macedonia, Republic of	447 (4.2)	437 (4.7)	460 (6.1)	465 (4.0)	442 (6.2)	451 (5.2)	6 (0.4)	429 (9.2)	49 (1.1)	461 (4.6)	45 (1.2)	448 (4.1)
Malaysia	519 (4.4)	532 (4.7)	497 (4.4)	505 (4.8)	491 (4.0)	514 (4.6)	2 (0.2)	(3) (3)	28 (0.9)	523 (6.5)	71 (1.0)	519 (4.2)
Moldova	469 (3.9)	465 (4.2)	481 (5.0)	477 (3.7)	450 (5.7)	479 (4.9)	8 (0.7)	452 (7.6)	48 (1.4)	476 (4.1)	44 (1.6)	473 (5.0)
Morocco	337 (2.6)	335 (3.6)	407 (2.2)	353 (4.7)	383 (3.5)	348 (3.5)	13 (0.9)	324 (8.0)	29 (0.9)	341 (6.6)	58 (1.5)	350 (3.2)
Netherlands	540 (7.1)	545 (7.1)	515 (5.5)	522 (7.7)	538 (7.9)	538 (5.8)	8 (1.1)	559 (14.0)	78 (1.3)	546 (6.7)	14 (1.5)	507 (12.2)
New Zealand	491 (5.2)	493 (5.0)	478 (4.2)	497 (4.7)	497 (5.0)	496 (5.3)	14 (0.9)	444 (6.7)	66 (1.2)	507 (5.3)	20 (1.2)	480 (6.6)
Philippines	345 (6.0)	378 (6.3)	383 (3.4)	345 (5.8)	406 (3.5)	355 (6.2)	5 (0.4)	288 (13.2)	42 (0.8)	363 (6.2)	53 (0.8)	347 (6.7)
Romania	472 (5.8)	458 (5.7)	487 (6.4)	481 (5.2)	453 (4.7)	491 (4.9)	9 (0.7)	417 (7.7)	25 (1.5)	457 (6.2)	66 (1.8)	494 (5.4)
Russian Federation	526 (5.9)	513 (6.4)	522 (6.0)	529 (4.9)	501 (4.8)	527 (6.0)	6 (0.5)	483 (10.0)	49 (1.3)	537 (6.7)	45 (1.5)	530 (5.2)
Singapore	604 (6.3)	608 (5.6)	560 (6.7)	576 (6.2)	562 (6.2)	599 (6.3)	5 (0.5)	562 (10.7)	34 (1.0)	612 (7.6)	61 (1.1)	604 (5.7)
Slovak Republic	534 (4.0)	525 (4.8)	527 (7.3)	525 (4.6)	521 (4.6)	537 (3.3)	6 (0.6)	535 (8.3)	70 (0.8)	542 (3.9)	23 (0.9)	513 (4.7)
Slovenia	530 (2.8)	527 (3.7)	506 (6.2)	525 (2.9)	530 (4.2)	523 (3.7)	8 (0.7)	530 (7.7)	63 (1.1)	541 (3.3)	29 (1.0)	511 (4.1)
South Africa	275 (6.8)	300 (6.0)	335 (6.6)	293 (7.7)	356 (3.8)	329 (4.8)	10 (0.8)	241 (14.1)	37 (0.7)	293 (8.6)	53 (1.1)	273 (7.9)
Thailand	467 (5.1)	471 (5.3)	484 (4.4)	456 (4.9)	476 (4.0)	463 (6.2)	6 (0.4)	424 (5.6)	45 (1.1)	459 (5.8)	49 (1.2)	482 (5.8)
Tunisia	448 (2.4)	443 (2.8)	484 (4.4)	455 (2.7)	446 (5.1)	442 (3.1)	7 (0.5)	439 (5.3)	27 (0.8)	452 (3.4)	66 (0.9)	450 (2.9)
Turkey	429 (4.3)	430 (4.3)	428 (5.7)	432 (4.6)	446 (3.3)	436 (6.5)	6 (0.6)	398 (7.1)	41 (1.0)	422 (4.4)	52 (1.4)	448 (4.7)
United States	502 (4.0)	509 (4.2)	473 (4.4)	506 (4.1)	506 (5.2)	482 (3.9)	15 (1.1)	466 (4.8)	58 (0.7)	514 (4.0)	27 (1.1)	505 (4.5)

—Not available.

[1] Data are for 8th grade or equivalent in most countries.

[2] Countries not meeting all International Association for the Evaluation of Educational Achievement's sampling specifications.

NOTE: Standard errors appear in parentheses. Because results are rounded to the nearest whole number some totals may appear inconsistent.

SOURCE: International Association for the Evaluation of Educational Achievement, Third International Mathematics and Science Study, 1999, *TIMSS 1999 International Mathematics Report,* by Ina V.S. Mullis et al. Copyright © 2000 International Association for the Evaluation of Educational Achievement (IEA). (This table was prepared May 2001.)

Average 8th grade science scores by content and studying

Table 400.—Average 8th-grade science scores by content areas, and average time spent studying out of school, by country: 1999

Country	Average achievement scale score							Distribution of daily out-of-school study time in science, with mean science scores					
								No time		Less than 1 hour		One hour or more	
	Overall science scores	Earth science	Life science	Physics	Chemistry	Environmental and resource issues	Scientific inquiry and the nature of science	Percent	Mean score	Percent	Mean score	Percent	Mean score
1	2	3	4	5	6	7	8	9	10	11	12	13	14
International average [1]	**488 (0.7)**	**488 (0.9)**	**488 (0.7)**	**488 (0.9)**	**488 (0.8)**	**488 (0.7)**	**488 (0.7)**	**14 (0.2)**	**462 (1.2)**	**49 (0.2)**	**495 (1.0)**	**36 (0.2)**	**486 (1.0)**
Australia	540 (4.4)	519 (6.1)	530 (4.4)	531 (6.3)	520 (5.0)	530 (6.3)	535 (4.9)	21 (1.4)	510 (6.6)	65 (1.4)	553 (4.4)	14 (0.8)	533 (6.9)
Belgium (Flemish)	535 (3.1)	533 (3.5)	535 (4.6)	530 (3.5)	508 (3.3)	513 (3.5)	526 (4.9)	14 (1.1)	537 (8.7)	55 (1.2)	543 (4.0)	31 (1.4)	520 (3.9)
Bulgaria	518 (5.4)	520 (5.7)	514 (6.9)	505 (5.8)	527 (5.7)	483 (6.4)	479 (5.6)	17 (1.6)	505 (8.7)	38 (1.2)	523 (6.7)	45 (1.5)	528 (7.0)
Canada	533 (2.1)	519 (3.7)	523 (3.8)	521 (3.8)	521 (5.4)	521 (3.5)	532 (5.1)	20 (1.0)	525 (4.1)	62 (0.9)	541 (2.3)	18 (0.7)	515 (4.4)
Chile	420 (3.7)	435 (7.0)	431 (3.7)	428 (5.6)	435 (5.2)	449 (4.8)	441 (4.7)	17 (0.7)	415 (4.9)	53 (0.8)	431 (4.7)	30 (1.0)	417 (5.4)
Chinese Taipei	569 (4.4)	538 (3.0)	550 (3.3)	552 (3.9)	563 (4.3)	567 (4.0)	540 (4.9)	38 (1.3)	530 (5.7)	42 (0.9)	588 (4.4)	20 (0.9)	607 (4.7)
Cyprus	460 (2.4)	459 (5.4)	468 (3.8)	459 (2.9)	470 (3.4)	475 (4.3)	467 (4.6)	18 (0.7)	425 (6.6)	57 (0.9)	474 (3.1)	25 (1.0)	461 (5.0)
Czech Republic	539 (4.2)	533 (6.9)	544 (4.1)	526 (4.2)	512 (5.2)	516 (5.7)	522 (5.7)	18 (1.1)	529 (7.0)	62 (1.2)	546 (4.5)	20 (1.1)	530 (5.0)
England	538 (4.8)	525 (3.9)	533 (6.2)	528 (4.5)	524 (5.5)	518 (5.8)	538 (5.1)	— —	— —	— —	— —	— —	— —
Finland	535 (3.5)	520 (5.5)	520 (4.0)	520 (4.4)	535 (4.5)	514 (7.1)	528 (4.0)	8 (0.8)	514 (9.7)	84 (0.9)	541 (3.5)	8 (0.6)	511 (10.8)
Hong Kong	530 (3.7)	506 (4.3)	516 (5.5)	523 (4.9)	515 (5.2)	518 (4.9)	531 (2.8)	39 (1.3)	513 (4.2)	48 (1.0)	543 (4.0)	13 (0.6)	539 (6.6)
Hungary	552 (3.7)	560 (3.9)	535 (4.0)	543 (4.3)	548 (4.7)	501 (6.6)	526 (5.9)	6 (0.6)	505 (8.6)	49 (1.2)	558 (4.0)	45 (1.3)	554 (4.0)
Indonesia	435 (4.5)	431 (6.4)	448 (3.6)	452 (5.5)	425 (3.9)	489 (4.8)	446 (4.3)	13 (0.8)	432 (6.7)	40 (0.9)	442 (4.9)	47 (1.1)	435 (5.9)
Iran, Islamic Republic	448 (3.8)	459 (5.2)	437 (3.7)	445 (5.7)	487 (4.1)	470 (5.5)	446 (5.3)	3 (0.3)	432 (16.0)	29 (1.0)	453 (4.1)	68 (1.1)	451 (4.6)
Israel [2]	468 (4.9)	472 (5.2)	463 (4.0)	484 (5.3)	479 (4.7)	458 (4.0)	476 (8.3)	17 (0.8)	449 (7.8)	60 (1.1)	487 (4.6)	23 (1.1)	450 (6.5)
Italy	493 (3.9)	502 (5.9)	488 (4.6)	480 (4.1)	493 (4.8)	491 (5.4)	489 (4.6)	7 (0.7)	435 (8.6)	48 (1.4)	501 (4.3)	45 (1.4)	498 (4.3)
Japan	550 (2.2)	533 (6.2)	534 (5.4)	544 (2.9)	530 (3.1)	506 (5.5)	543 (2.8)	39 (1.4)	535 (3.2)	50 (1.2)	560 (2.3)	12 (0.7)	555 (7.5)
Jordan	450 (3.8)	446 (3.5)	448 (4.1)	459 (3.6)	483 (5.5)	476 (6.0)	440 (5.5)	7 (0.5)	396 (9.2)	37 (1.0)	466 (5.0)	56 (1.1)	465 (3.7)
Korea, Republic of	549 (2.6)	532 (2.7)	528 (3.6)	544 (5.1)	523 (3.7)	523 (4.5)	545 (7.3)	45 (0.8)	527 (2.9)	42 (0.7)	564 (3.1)	13 (0.6)	578 (4.6)
Latvia (Latvian-speaking schools) [2]	503 (4.8)	495 (5.4)	509 (3.9)	495 (3.9)	490 (3.7)	493 (5.2)	495 (4.7)	9 (0.6)	480 (9.9)	66 (1.0)	509 (5.4)	25 (1.0)	496 (6.3)
Lithuania [2]	488 (4.1)	476 (4.4)	494 (4.6)	510 (4.3)	485 (4.6)	458 (5.1)	483 (6.4)	10 (0.9)	456 (8.2)	66 (1.2)	493 (4.8)	25 (1.2)	494 (4.9)
Macedonia, Republic of	458 (5.2)	464 (4.2)	468 (4.9)	463 (6.0)	481 (6.1)	432 (4.2)	464 (3.6)	3 (0.3)	428 (15.3)	25 (1.0)	453 (5.9)	72 (1.2)	470 (5.3)
Malaysia	492 (4.4)	491 (4.2)	479 (5.4)	494 (4.1)	485 (3.5)	502 (4.4)	488 (4.5)	4 (0.3)	460 (10.6)	36 (1.1)	493 (5.1)	60 (1.2)	495 (4.9)
Moldova	459 (4.0)	466 (4.2)	477 (3.9)	457 (5.5)	451 (5.6)	444 (6.2)	471 (3.8)	7 (0.6)	439 (10.8)	29 (1.0)	460 (5.8)	63 (1.2)	467 (4.2)
Morocco	323 (4.3)	363 (3.3)	347 (2.8)	352 (4.2)	372 (4.8)	396 (5.1)	391 (4.2)	14 (0.8)	323 (12.4)	35 (1.2)	330 (4.9)	51 (1.7)	335 (6.4)
Netherlands	545 (6.9)	534 (7.2)	536 (7.2)	537 (6.5)	515 (6.4)	526 (8.5)	534 (6.5)	6 (0.8)	530 (11.6)	80 (1.5)	555 (6.4)	15 (1.3)	507 (12.9)
New Zealand	510 (4.9)	504 (5.8)	501 (5.6)	499 (4.7)	503 (4.9)	503 (5.2)	521 (6.8)	18 (1.1)	472 (6.8)	66 (1.2)	528 (4.8)	15 (1.0)	491 (7.7)
Philippines	345 (7.5)	390 (5.0)	378 (5.7)	393 (6.3)	394 (6.5)	391 (7.6)	403 (5.5)	5 (0.4)	294 (14.4)	41 (0.8)	365 (9.7)	54 (0.9)	348 (7.7)
Romania	472 (5.8)	475 (5.5)	475 (6.0)	465 (6.8)	481 (6.1)	473 (6.6)	456 (5.5)	16 (0.9)	451 (8.4)	36 (1.0)	479 (7.8)	48 (1.3)	484 (5.6)
Russian Federation	529 (6.4)	529 (5.1)	517 (6.5)	529 (6.3)	523 (8.0)	495 (6.6)	491 (4.9)	5 (0.4)	494 (8.4)	34 (1.3)	534 (7.1)	61 (1.3)	536 (6.4)
Singapore	568 (8.0)	521 (7.3)	541 (7.2)	570 (6.7)	545 (8.3)	577 (8.3)	550 (5.9)	7 (0.6)	507 (13.2)	38 (1.1)	573 (9.9)	55 (1.2)	573 (7.1)
Slovak Republic	535 (3.3)	537 (4.3)	535 (6.2)	518 (4.1)	525 (4.9)	512 (4.5)	507 (3.9)	8 (0.7)	521 (7.5)	67 (1.2)	539 (3.7)	25 (1.2)	532 (4.8)
Slovenia	533 (3.2)	541 (4.3)	521 (3.9)	525 (4.4)	509 (5.4)	519 (3.4)	513 (4.3)	10 (0.8)	526 (6.7)	52 (1.1)	546 (3.7)	38 (1.1)	521 (4.2)
South Africa	243 (7.8)	348 (4.8)	289 (7.3)	308 (6.7)	350 (4.0)	350 (8.5)	329 (6.4)	15 (1.8)	211 (14.0)	39 (1.1)	269 (11.1)	47 (1.3)	237 (8.7)
Thailand	482 (4.0)	470 (3.9)	508 (4.5)	475 (4.2)	439 (4.3)	507 (3.0)	462 (4.2)	8 (0.5)	455 (4.8)	50 (1.1)	480 (4.8)	42 (1.2)	493 (5.2)
Tunisia	430 (3.4)	442 (2.7)	441 (5.0)	425 (6.3)	439 (3.7)	462 (5.0)	451 (3.4)	13 (0.8)	438 (8.2)	39 (0.9)	434 (5.3)	48 (1.0)	425 (2.8)
Turkey	433 (4.3)	435 (4.6)	444 (4.5)	441 (4.0)	437 (5.0)	461 (3.6)	445 (6.3)	6 (0.5)	409 (12.9)	44 (0.9)	433 (4.0)	51 (1.2)	444 (4.4)
United States	515 (4.6)	504 (4.2)	520 (4.1)	498 (5.5)	508 (4.8)	509 (6.4)	522 (4.3)	24 (1.4)	495 (6.4)	60 (1.3)	532 (4.6)	16 (0.8)	502 (5.9)

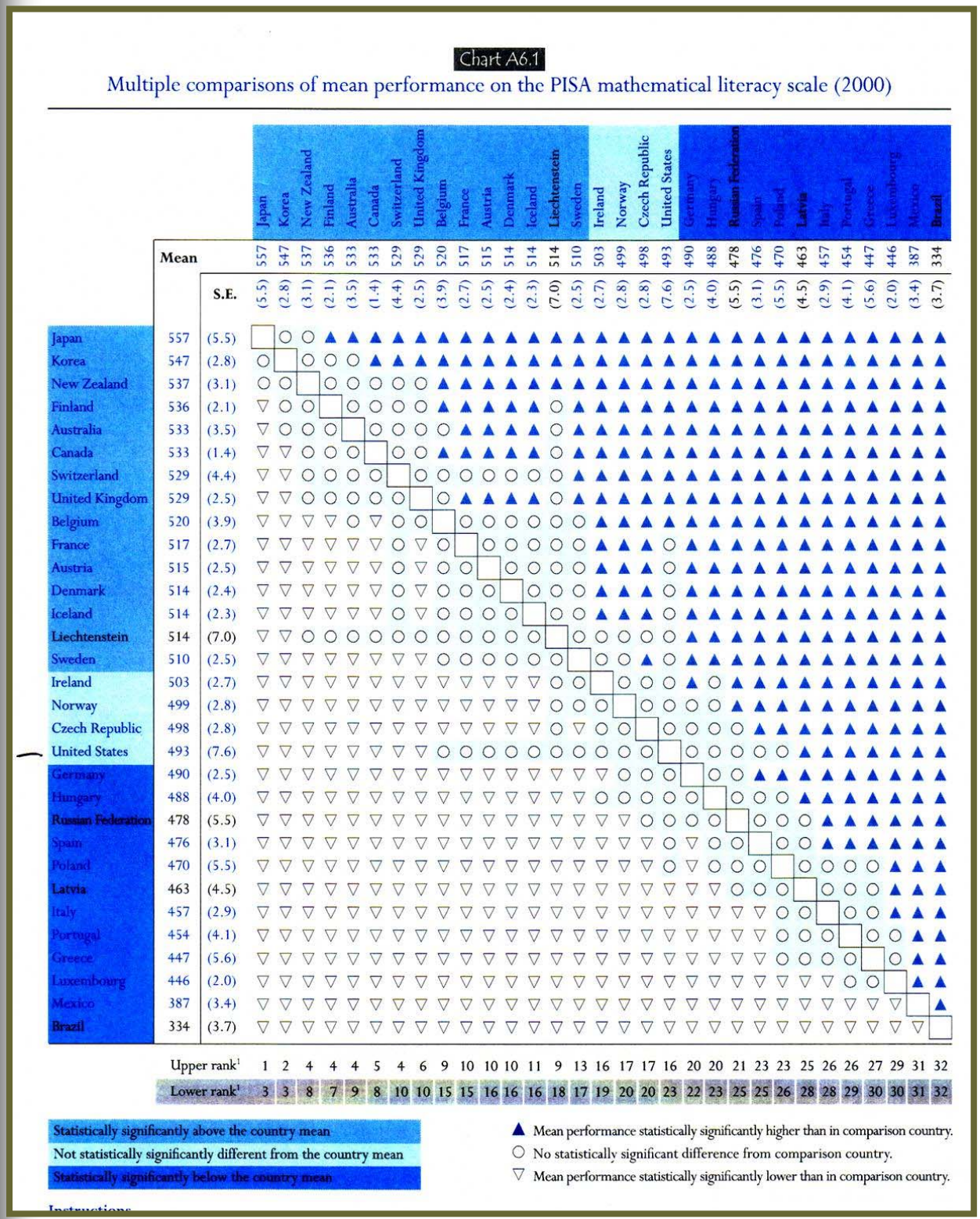
—Not available.

[1] Data are for 8th grade or equivalent in most countries.

[2] Countries not meeting all International Association for the Evaluation of Educational Achievement's sampling specifications.

NOTE: Standard errors appear in parentheses. Because results are rounded to the nearest whole number some totals may appear inconsistent.

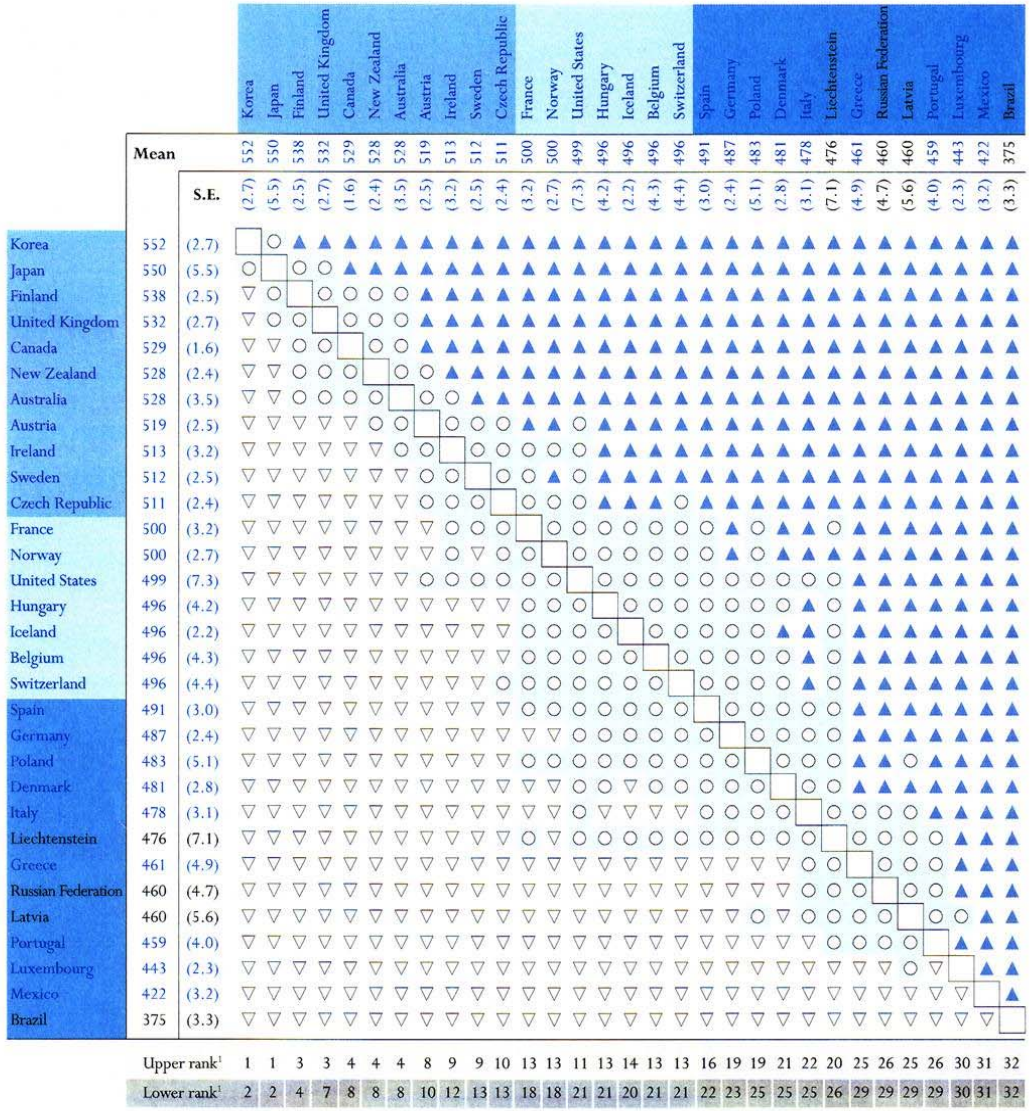
SOURCE: International Association for the Evaluation of Education Achievement (IEA), Third International Mathematics and Science Study 1999, *TIMMS 1999 International Science Report,* by Michael O. Martin et al. Copyright © 2000. (This table was prepared June 2001.)



Multiple comparisons of mean performance on the PISA mathematical literacy scale

Chart A6.2

Multiple comparisons of mean performance on the PISA scientific literacy scale (2000)



Statistically significantly above the country mean
Not statistically significantly different from the country mean
Statistically significantly below the country mean

▲ Mean performance statistically significantly higher than in comparison country.
○ No statistically significant difference from comparison country.
▽ Mean performance statistically significantly lower than in comparison country.

Instructions

Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the mean performance of the country in the row is statistically significantly lower than that of the comparison country, statistically significantly higher than that of the comparison country, or if there is no statistically significant difference between the mean performance of the two countries.

Note: Countries are presented in descending order of mean performance on the PISA scientific literacy scale. Due to low response rates, the Netherlands is excluded from the figure. Assuming negligible to moderate levels of bias due to non-response, the position of the Netherlands may be expected, with 95 per cent confidence, to lie between 3rd and 14th place among countries.

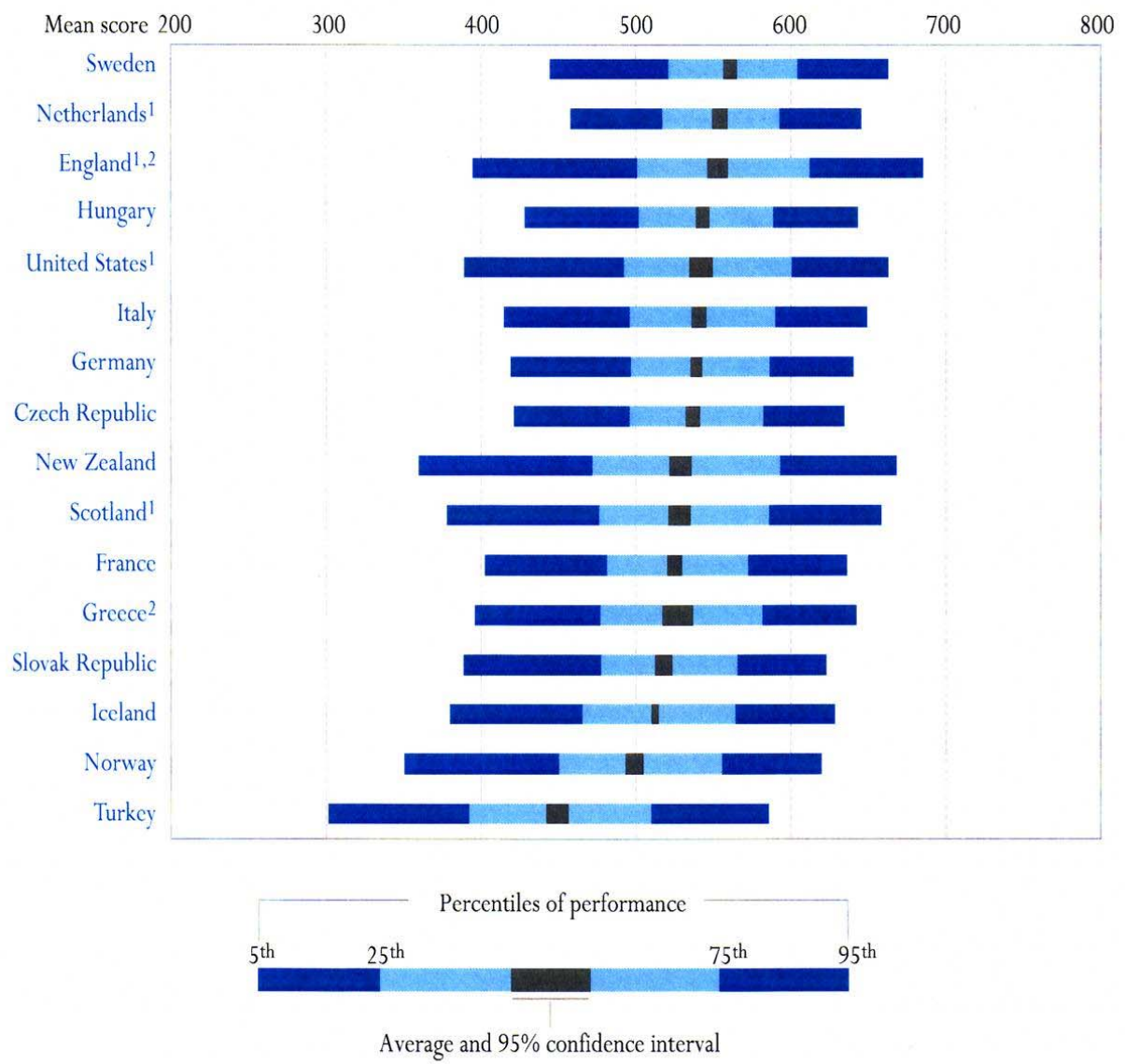
1. Because data are based on samples, it is not possible to report exact rank order positions for countries. However, it is possible to report the range of rank order positions within which the country mean lies with 95 per cent likelihood.

Source: OECD PISA database, 2001. See Annex 3 for notes on methodology *(www.oecd.org/edu/eag2003)* and *www.pisa.oecd.org.*

Multiple comparisons of mean performance on the PISA scientific literacy scale

Chart A4.3

Distribution of performance of 4th-grade students on the PIRLS reading literacy scale (2001)



1. Met guidelines for sample participation rates only after replacement schools were included.
2. National defined population covers less than 95 per cent of national desired population.

Countries are ranked in descending order of mean performance on the PIRLS reading literacy scale.

Source: IEA Progress in Reading Literacy Study (PIRLS) 2001. Table A4.1. See Annex 3 for notes *(www.oecd.org/edu/eag2003).*

Distribution of performance of 4th grade students on the PIRL reading literacy scale

Multiple comparisons of mean performance of 4th grade students on the PIRL reading literacy scale

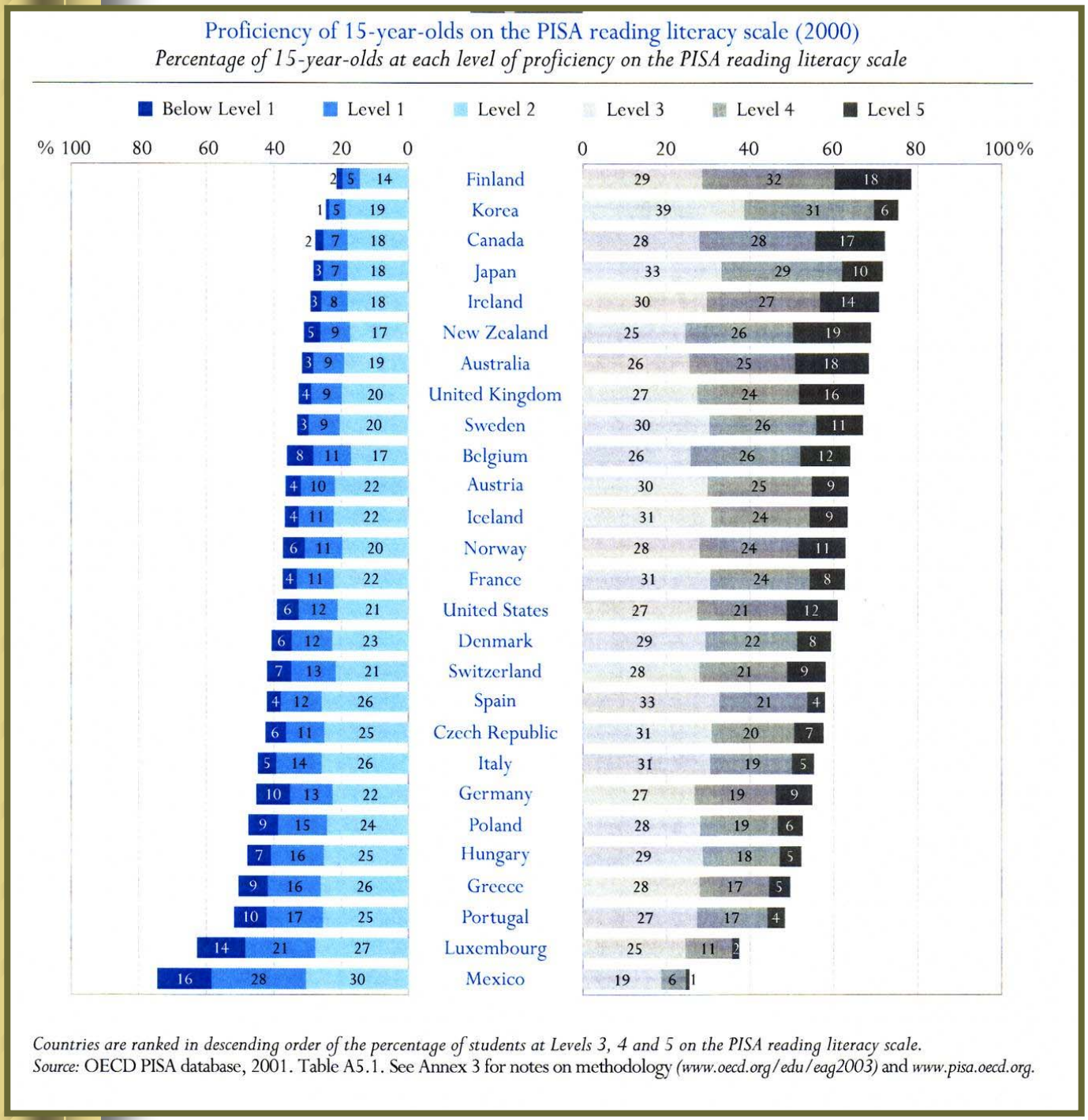
Multiple comparisons of mean performance of 4th-grade students on the PIRLS reading literacy scale (2001)

	Mean	S.E.	Years of formal schooling	Average age	Sweden	Netherlands[1]	England[1]	Hungary	United States[1]	Italy	Germany	Czech Republic	New Zealand	Scotland[1]	France	Greece[2]	Slovak Republic	Iceland	Norway	Turkey
					561	554	553	543	542	541	539	537	529	528	525	524	518	512	499	449
					(2.2)	(2.5)	(3.4)	(2.2)	(3.8)	(2.4)	(1.9)	(2.3)	(3.6)	(3.6)	(2.4)	(3.5)	(2.8)	(1.2)	(2.9)	(3.5)
					4	4	5	4	4	4	4	4	5	5	4	4	4	4	4	4
					10.8	10.3	10.2	10.7	10.2	9.8	10.5	10.5	10.1	9.8	10.1	9.9	10.3	9.7	10.0	10.2
Sweden	561	(2.2)	4	10.8		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Netherlands[1]	554	(2.5)	4	10.3	▽		○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
England[1]	553	(3.4)	5	10.2	▽	○		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Hungary	543	(2.2)	4	10.7	▽	▽	▽		○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲
United States[1]	542	(3.8)	4	10.2	▽	▽	▽	○		○	○	○	▲	▲	▲	▲	▲	▲	▲	▲
Italy	541	(2.4)	4	9.8	▽	▽	▽	○	○		○	○	▲	▲	▲	▲	▲	▲	▲	▲
Germany	539	(1.9)	4	10.5	▽	▽	▽	○	○	○		○	▲	▲	▲	▲	▲	▲	▲	▲
Czech Republic	537	(2.3)	4	10.5	▽	▽	▽	▽	○	○	○		○	▲	▲	▲	▲	▲	▲	▲
New Zealand	529	(3.6)	5	10.1	▽	▽	▽	▽	▽	▽	▽	○		○	○	○	▲	▲	▲	▲
Scotland[1]	528	(3.6)	5	9.8	▽	▽	▽	▽	▽	▽	▽	▽	○		○	○	▲	▲	▲	▲
France	525	(2.4)	4	10.1	▽	▽	▽	▽	▽	▽	▽	▽	○	○		○	○	▲	▲	▲
Greece[2]	524	(3.5)	4	9.9	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○		○	▲	▲	▲
Slovak Republic	518	(2.8)	4	10.3	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○		○	▲	▲
Iceland	512	(1.2)	4	9.7	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○		▲	▲
Norway	499	(2.9)	4	10.0	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽		▲
Turkey	449	(3.5)	4	10.2	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	

Instructions:
Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the mean performance of the country in the row is significantly higher than that of the comparison country, significantly lower than that of the comparison country, or if there is no statistically significant difference between the mean performance of the two countries.

▲ Mean performance statistically significantly higher than in comparison country.
○ No statistically significant difference from comparison country.
▽ Mean performance statistically significantly lower than in comparison country.

Mean performance statistically significantly above the country mean
Not statistically significantly different from the country mean
Mean performance statistically significantly below the country mean



Countries are ranked in descending order of the percentage of students at Levels 3, 4 and 5 on the PISA reading literacy scale.
Source: OECD PISA database, 2001. Table A5.1. See Annex 3 for notes on methodology *(www.oecd.org/edu/eag2003)* and *www.pisa.oecd.org.*

Proficiency of 15-year-olds on the PISA reading literacy scale

Average reading, mathematics, and science literacy scores of 15-year-olds

Table 408.—Average reading, mathematics, and science literacy scores[1] of 15-year-olds, by sex: Selected countries, 2000

Country	Reading literacy			Mathematics literacy			Science literacy		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
1	2	3	4	5	6	7	8	9	10
OECD total[2]	**499 (2.0)**	**485 (2.3)**	**514 (2.0)**	**498 (2.1)**	**504 (2.6)**	**493 (2.3)**	**502 (2.0)**	**502 (2.5)**	**503 (2.0)**
OECD average[3]	**500 (0.6)**	**485 (0.8)**	**517 (0.7)**	**500 (0.7)**	**506 (1.0)**	**495 (0.9)**	**500 (0.7)**	**501 (0.9)**	**501 (0.8)**
Australia	528 (3.5)	513 (4.0)	546 (4.7)	533 (3.5)	539 (4.1)	527 (5.1)	528 (3.5)	526 (3.9)	529 (4.8)
Austria	507 (2.4)	495 (3.2)	520 (3.6)	515 (2.5)	530 (4.0)	503 (3.7)	519 (2.6)	526 (3.8)	514 (4.3)
Belgium	507 (3.6)	492 (4.2)	525 (4.9)	520 (3.9)	524 (4.6)	518 (5.2)	496 (4.3)	496 (5.2)	498 (5.6)
Canada	534 (1.6)	519 (1.8)	551 (1.7)	533 (1.4)	539 (1.8)	529 (1.6)	529 (1.6)	529 (1.9)	531 (1.7)
Czech Republic	492 (2.4)	473 (4.1)	510 (2.5)	498 (2.8)	504 (4.4)	492 (3.0)	511 (2.4)	512 (3.8)	511 (3.2)
Denmark	497 (2.4)	485 (3.0)	510 (2.9)	514 (2.4)	522 (3.1)	507 (3.0)	481 (2.8)	488 (3.9)	476 (3.5)
Finland	546 (2.6)	520 (3.0)	571 (2.8)	536 (2.2)	537 (2.8)	536 (2.6)	538 (2.5)	534 (3.5)	541 (2.7)
France	505 (2.7)	490 (3.5)	519 (2.7)	517 (2.7)	525 (4.1)	511 (2.8)	500 (3.2)	504 (4.2)	498 (3.8)
Germany	484 (2.5)	468 (3.2)	502 (3.9)	490 (2.5)	498 (3.1)	483 (4.0)	487 (2.4)	489 (3.4)	487 (3.4)
Greece	474 (5.0)	456 (6.1)	493 (4.6)	447 (5.6)	451 (7.7)	444 (5.4)	461 (4.9)	457 (6.1)	464 (5.2)
Hungary	480 (4.0)	465 (5.3)	496 (4.3)	488 (4.0)	492 (5.2)	485 (4.9)	496 (4.2)	496 (5.8)	497 (5.0)
Iceland	507 (1.5)	488 (2.1)	528 (2.1)	514 (2.3)	513 (3.1)	518 (2.9)	496 (2.2)	495 (3.4)	499 (3.0)
Ireland	527 (3.2)	513 (4.2)	542 (3.6)	503 (2.7)	510 (4.0)	497 (3.4)	513 (3.2)	511 (4.2)	517 (4.2)
Italy	487 (2.9)	469 (5.1)	507 (3.6)	457 (2.9)	462 (5.3)	454 (3.8)	478 (3.1)	474 (5.6)	483 (3.9)
Japan	522 (5.2)	507 (6.7)	537 (5.4)	557 (5.5)	561 (7.3)	553 (5.9)	550 (5.5)	547 (7.2)	554 (5.9)
Korea, Republic of	525 (2.4)	519 (3.8)	533 (3.7)	547 (2.8)	559 (4.6)	532 (5.1)	552 (2.7)	561 (4.3)	541 (5.1)
Luxembourg	441 (1.6)	429 (2.6)	456 (2.3)	446 (2.0)	454 (3.0)	439 (3.2)	443 (2.3)	441 (3.6)	448 (3.2)
Mexico	422 (3.3)	411 (4.2)	432 (3.8)	387 (3.4)	393 (4.5)	382 (3.8)	422 (3.2)	423 (4.2)	419 (3.9)
Netherlands[4]	— —	517 (4.8)	547 (3.8)	— —	569 (4.9)	558 (4.6)	— —	529 (6.3)	529 (5.1)
New Zealand	529 (2.8)	507 (4.2)	553 (3.8)	537 (3.1)	536 (5.0)	539 (4.1)	528 (2.4)	523 (4.6)	535 (3.8)
Norway	505 (2.8)	486 (3.8)	529 (2.9)	499 (2.8)	506 (3.8)	495 (2.9)	500 (2.8)	499 (4.1)	505 (3.3)
Poland	479 (4.5)	461 (6.0)	498 (5.5)	470 (5.5)	472 (7.5)	468 (6.3)	483 (5.1)	486 (6.1)	480 (6.5)
Portugal	470 (4.5)	458 (5.0)	482 (4.6)	454 (4.1)	464 (4.7)	446 (4.7)	459 (4.0)	456 (4.8)	462 (4.2)
Spain	493 (2.7)	481 (3.4)	505 (2.8)	476 (3.1)	487 (4.3)	469 (3.3)	491 (3.0)	492 (3.5)	491 (3.6)
Sweden	516 (2.2)	499 (2.6)	536 (2.5)	510 (2.5)	514 (3.2)	507 (3.0)	512 (2.5)	512 (3.5)	513 (2.9)
Switzerland	494 (4.3)	480 (4.9)	510 (4.5)	529 (4.4)	537 (5.3)	523 (4.8)	496 (4.4)	500 (5.7)	493 (4.7)
United Kingdom	523 (2.6)	512 (3.0)	537 (3.4)	529 (2.5)	534 (3.5)	526 (3.7)	532 (2.7)	535 (3.4)	531 (4.0)
United States	504 (7.1)	490 (8.4)	518 (6.2)	493 (7.6)	497 (8.9)	490 (7.3)	499 (7.3)	497 (8.9)	502 (6.5)
Non-OECD countries									
Brazil	396 (3.1)	388 (3.9)	404 (3.4)	334 (3.7)	349 (4.7)	322 (4.7)	375 (3.3)	376 (4.8)	376 (3.8)
Latvia	458 (5.3)	432 (5.5)	485 (5.4)	463 (4.5)	467 (5.3)	460 (5.6)	460 (5.6)	449 (6.4)	472 (5.8)
Liechtenstein	483 (4.1)	468 (7.3)	500 (6.8)	514 (7.0)	521 (11.5)	510 (11.1)	476 (7.1)	484 (10.9)	468 (9.3)
Russian Federation	462 (4.2)	443 (4.5)	481 (4.1)	478 (5.5)	478 (5.7)	479 (6.2)	460 (4.7)	453 (5.4)	467 (5.2)

What Does This Tell Us?

- **Regardless of socio-economic status, family background, etc., the schools are failing to teach *basic skills* in middle and upper schools**
- **When we look at college-going (matriculation) and persistence rates we need to remember - we are falling behind in *middle school!!***
- **And, we need to recognize that because we do reasonably well on skill tests in the 4th grade, we do not have an insuperable problem of aptitude, genetics, ability to learn, socio-economic background, or family structure. All of these things have a strong effect on students, but the changes over the school career, particularly compared to much poorer countries, show the importance of *school itself* in the position of our students**
- ***School makes a difference!***

Who Spends the Most on Education?

- **Those of you who carefully read the *Kansas City Star* and the *St. Louis Post Dispatch* will be surprised**
- **The U.S. spends considerably more than the Europeans, the Asians, and all industrialized countries except Canada, Norway, and Switzerland**
- **This is at all levels, but is especially significant in higher education**
- **The resource gap is entirely in favor of the U.S.**
- **Budget problems are occurring today around the world and are not exclusive to the U.S.**

Reprise - Is It the Money?

- **U.S. is #1 in annual expenditure per pupil from primary to tertiary (post-secondary or college)**
- **Switzerland is not too far behind, then there is a big drop off**
  - **U.S. - $10,600**
  - **Switzerland - $9600**
  - **Next group - $8600 per pupil**

    (chart B1.1 OECD Education at a Glance)
- **With the exception of Norway, the U.S. is *#1* at all levels of spending per pupil relative to GDP *(chart B1.5)***

Reprise - Is It the Money?

- **We spend over 50% more at the *primary* level than the OECD average –**
  - **U.S. $6995 vs. OECD $4470**
- **We spend about 60% more at the *secondary* level –**
  - **U.S. $8855 vs. OECD $5991**
- **We spend almost *twice* the amount in higher education –**
  - **U.S. $20,358 vs. OECD $11,109**

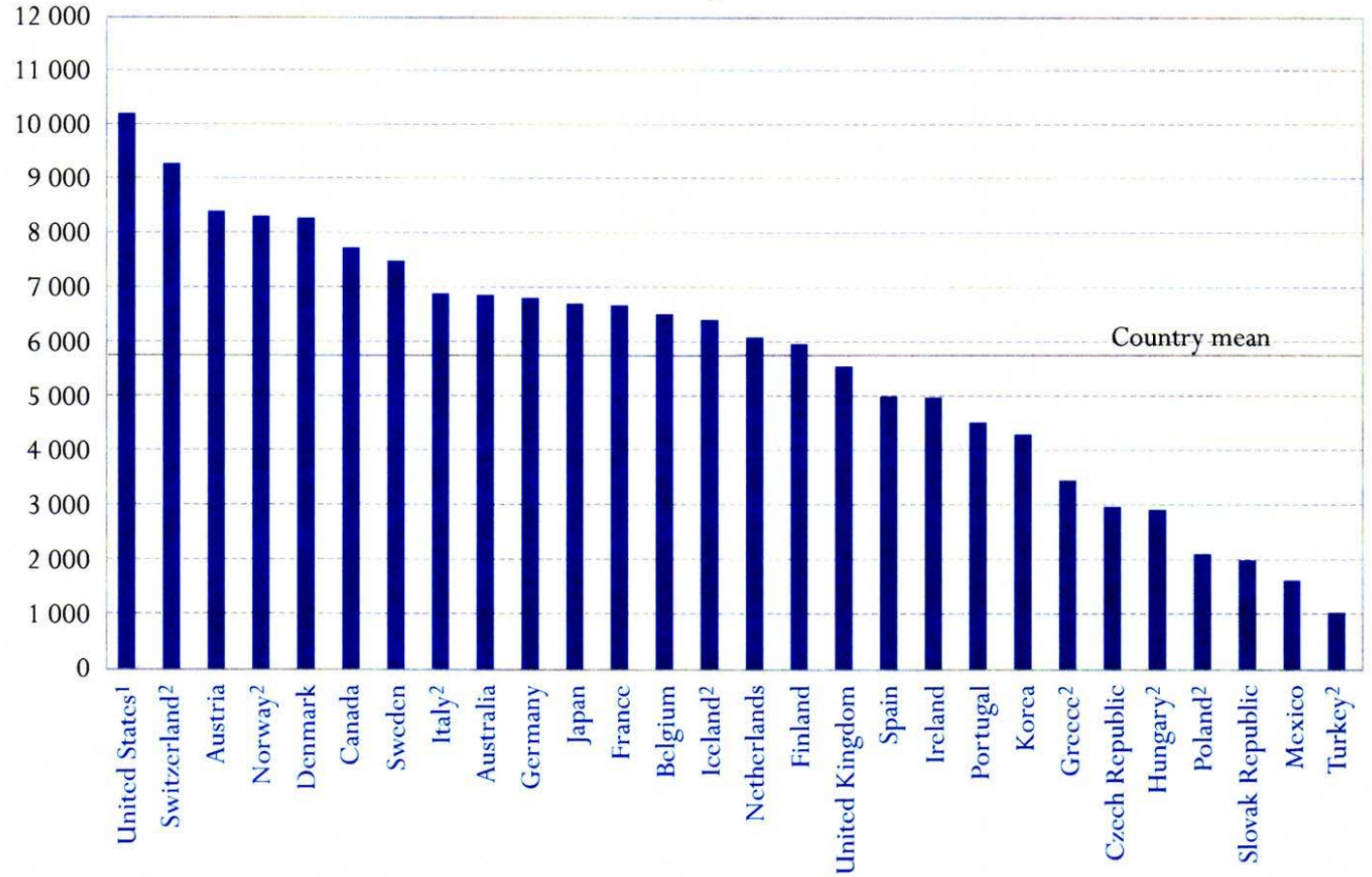
  (table B1.1)

Expenditure on education institutions per student

Chart B1.1

Expenditure on educational institutions per student (2000)

Annual expenditure on educational institutions per student in equivalent US dollars converted using PPPs, for primary to tertiary education, based on full-time equivalents



1. Public and independent private institutions only.
2. Public institutions only.

Countries are ranked in descending order of expenditure per student.

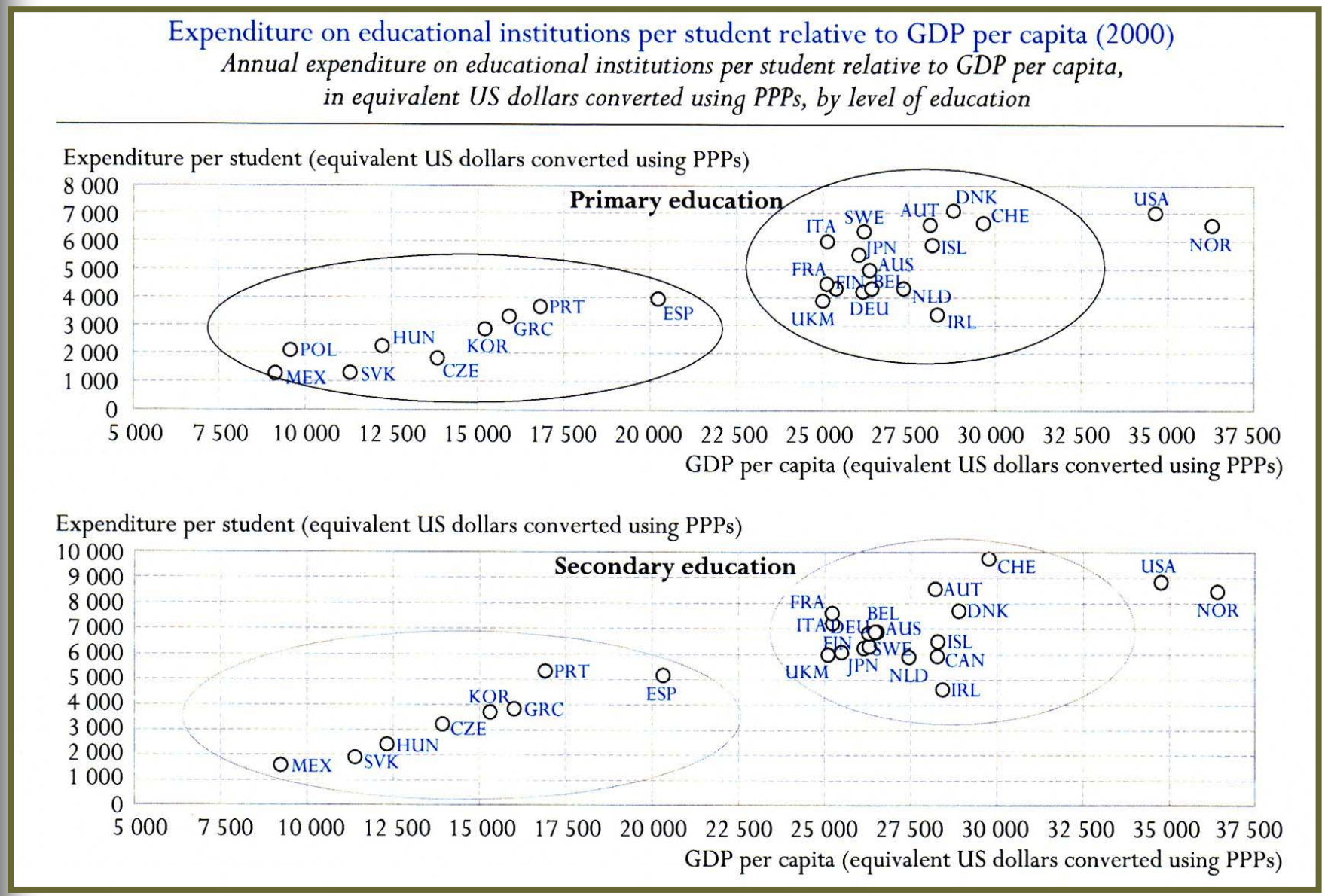
Source: OECD. Table B1.1. See Annex 3 for notes *(www.oecd.org/edu/eag2003)*.

So:

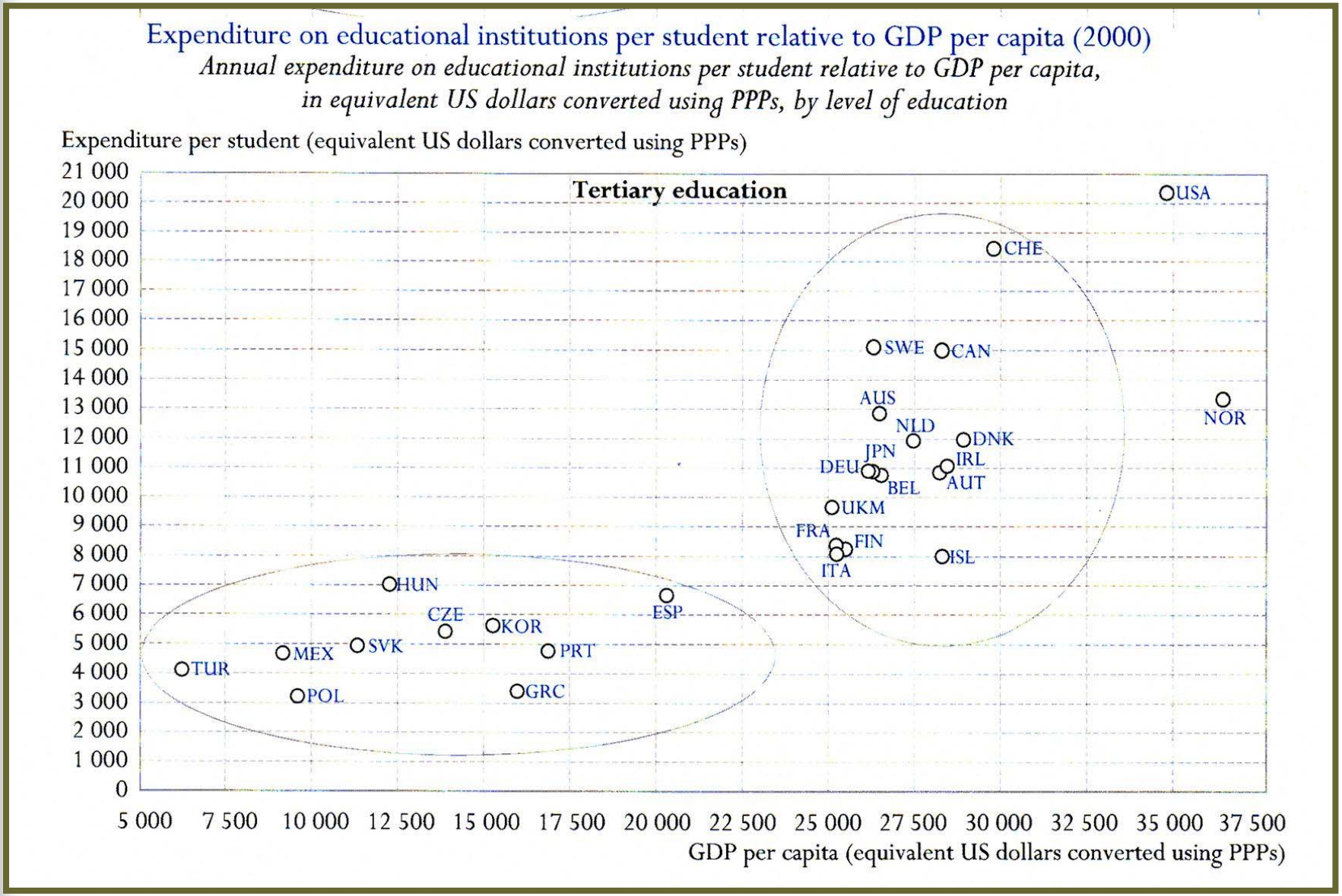
- Its not money,
- Its not graduation rates,
- Its skills, its content. Its

Learning!!

Expenditure on educational institutions per student relative to GDP per capita – primary and secondary



Expenditure on educational institutions per student relative to GDP per capita – tertiary



Expenditure on educational institutions per student

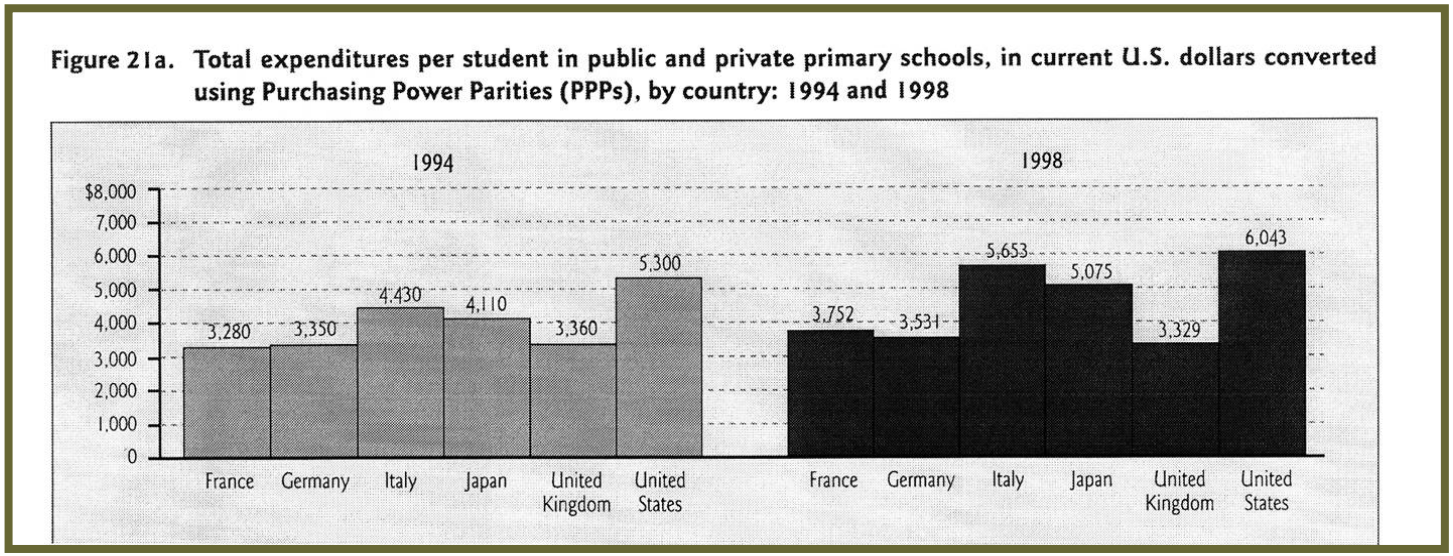
Table B1.1

Expenditure on educational institutions per student (2000)

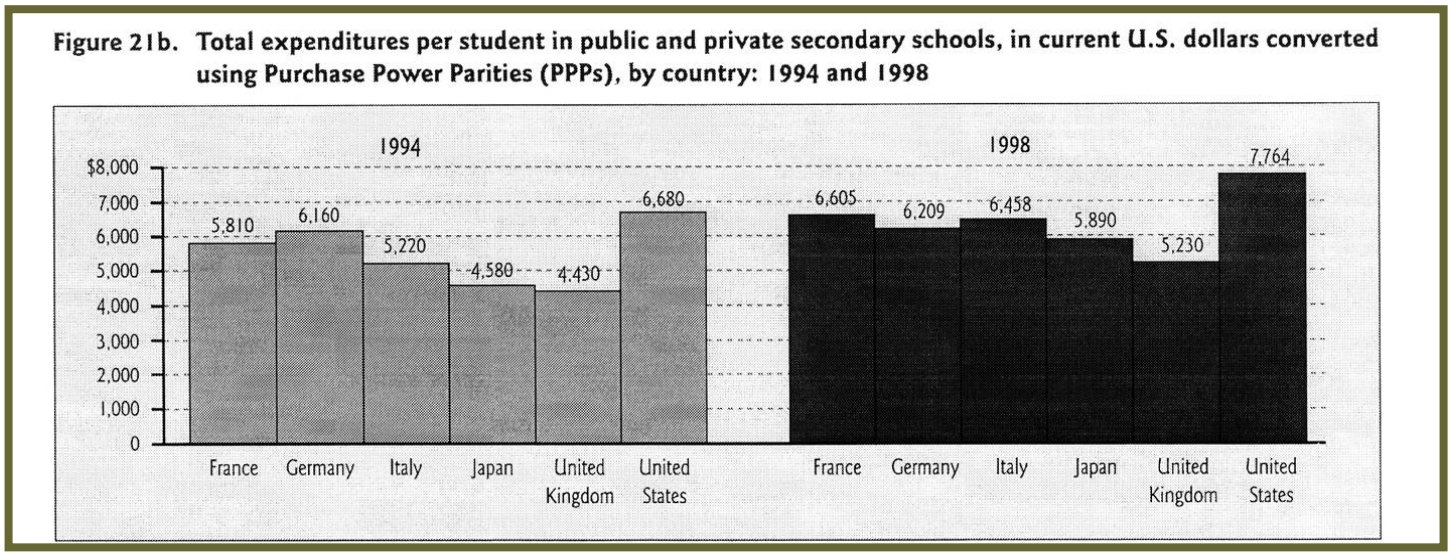
Annual expenditure on educational institutions per student in equivalent US dollars converted using PPPs , by level of education, based on full-time equivalents

		Pre-primary education (for children 3 years and older)	Primary education	Lower secondary education	Upper secondary education	All secondary education	Post-secondary non-tertiary education	Tertiary education			Expenditure from primary to tertiary education
								All tertiary education	Tertiary-type B education	Tertiary-type A and advanced research programmes	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
OECD COUNTRIES	Australia	m	4 967	6 579	7 424	6 894	6694	12 854	7 260	14 044	6 904
	Austria	5 471	6 560	8 934	8 165	8 578	10947	10 851	x(7)	x(7)	8 430
	Belgium	3 282	4 310	x(5)	x(5)	6 889	x(5)	10 771	x(7)	x(7)	6 544
	Canada	6 120	x(5)	x(5)	x(5)	5 947	x(8)	14 983	12 801	16 690	7 764
	Czech Republic	2 435	1 827	3 134	3 360	3 239	1624	5 431	1 970	5 946	3 004
	Denmark	4 255	7 074	7 222	8 164	7 726	x(4,7)	11 981	x(7)	x(7)	8 302
	Finland	3 944	4 317	6 737	5 641	6 094	x(5)	8 244	4 208	8 426	6 003
	France	4 119	4 486	7 076	8 334	7 636	6207	8 373	8 898	8 230	6 708
	Germany	5 138	4 198	5 470	9 625	6 826	10148	10 898	5 728	11 754	6 849
	Greece[1]	x(2)	3 318	x(5)	x(5)	3 859	1400	3 402	2 889	3 643	3 494
	Hungary[1]	2 511	2 245	2 109	2 829	2 446	3223	7 024	3 474	7 098	2 956
	Iceland[1]	m	5 854	6 705	6378	6 518	m	7 994	m	7 548	6 446
	Ireland	2 863	3 385	4 625	4 655	4 638	4234	11 083	x(7)	x(7)	5 016
	Italy[1]	5 771	5 973	7 089	7 308	7 218	m	8 065	4 114	8 136	6 928
	Japan	3 376	5 507	5 904	6 615	6 266	x(4,7)	10 914	8 507	11 302	6 744
	Korea	1 949	3 155	3 655	4 440	4 069	a	6 118	4 106	7 502	4 294
	Luxembourg	m	m	m	m	m	m	m	m	m	m
	Mexico	1 385	1 291	1 289	2 317	1 615	a	4 688	x(7)	x(7)	1 666
	Netherlands	3 920	4 325	6 100	5 671	5 912	5006	11 934	6 890	12 004	6 125
	New Zealand	m	m	m	m	m	m	m	m	m	m
	Norway[1]	13 170	6 550	8 185	8 925	8 476	x(5)	13 353	x(7)	x(7)	8 333
	Poland[1]	2 278	2 105	x(2)	1 790	m	x(4)	3 222	1 135	3 252	2 149
	Portugal	2 237	3 672	5 151	5 563	5 349	a	4 766	x(7)	x(7)	4 552
	Slovak Republic	1 644	1 308	1 558	2 488	1 927	x(4)	4 949	x(4)	4 949	2 028
	Spain	3 370	3 941	x(5)	x(5)	5 185	x(5)	6 666	6 306	6 712	5 037
	Sweden	3 343	6 336	6 238	6 411	6 339	4452	15 097	x(7)	x(7)	7 524
	Switzerland[1]	3 114	6 631	8 012	11 622	9 780	7199	18 450	10 516	19 491	9 311
	Turkey[1]	m	m	m	m	m	a	4 121	x(7)	x(7)	1 073
	United Kingdom	6 677	3 877	x(5)	x(5)	5 991	x(5)	9 657	x(7)	x(7)	5 592
	United States[2]	7 980	6 995	x(5)	x(5)	8 855	x(7)	20 358	x(7)	x(7)	10 240
	Country mean	***4 137***	***4 381***	***5 575***	***6 063***	***5 957***	***4075***	***9 571***	***~***	***~***	***5 736***
	OECD total	***4 477***	***4 470***	***~***	***~***	***5 501***	***~***	***11 109***	***~***	***~***	***6 361***

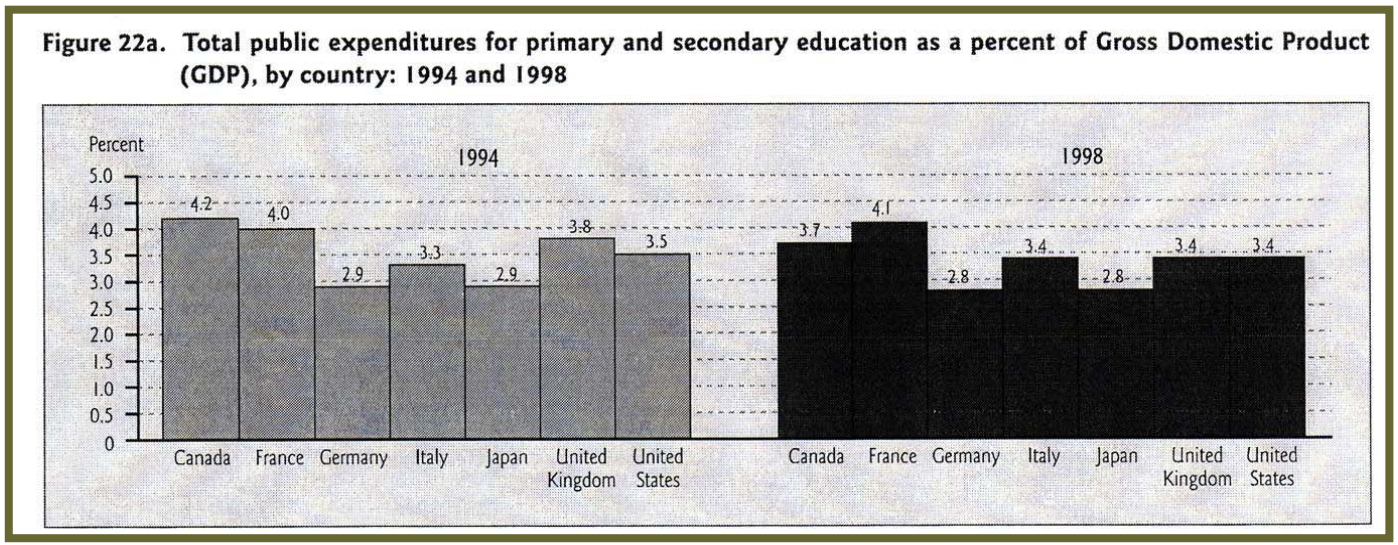
Total expenditures per student in public and private primary schools, in current U.S. dollars converted using PPPs by country



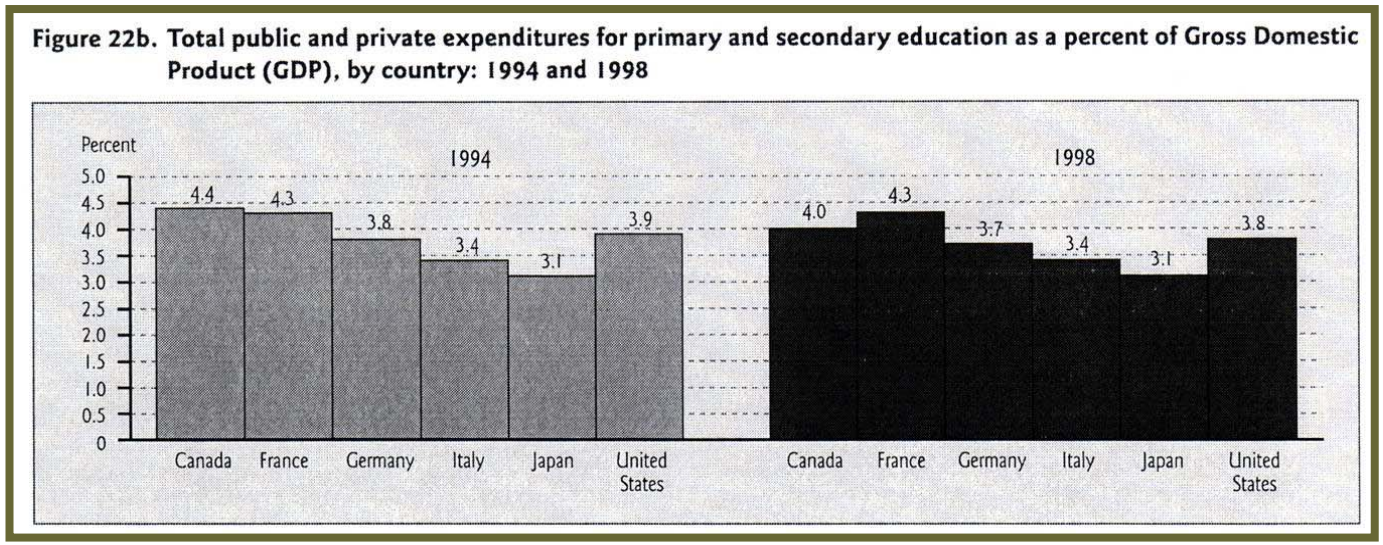
Total expenditures per student in public and private secondary schools, in current U.S. dollars converted using PPPs by country



Total expenditures per student in public and private primary schools as a percent of GDP by country



Total expenditures per student in public and private secondary schools as a percent of GDP by country

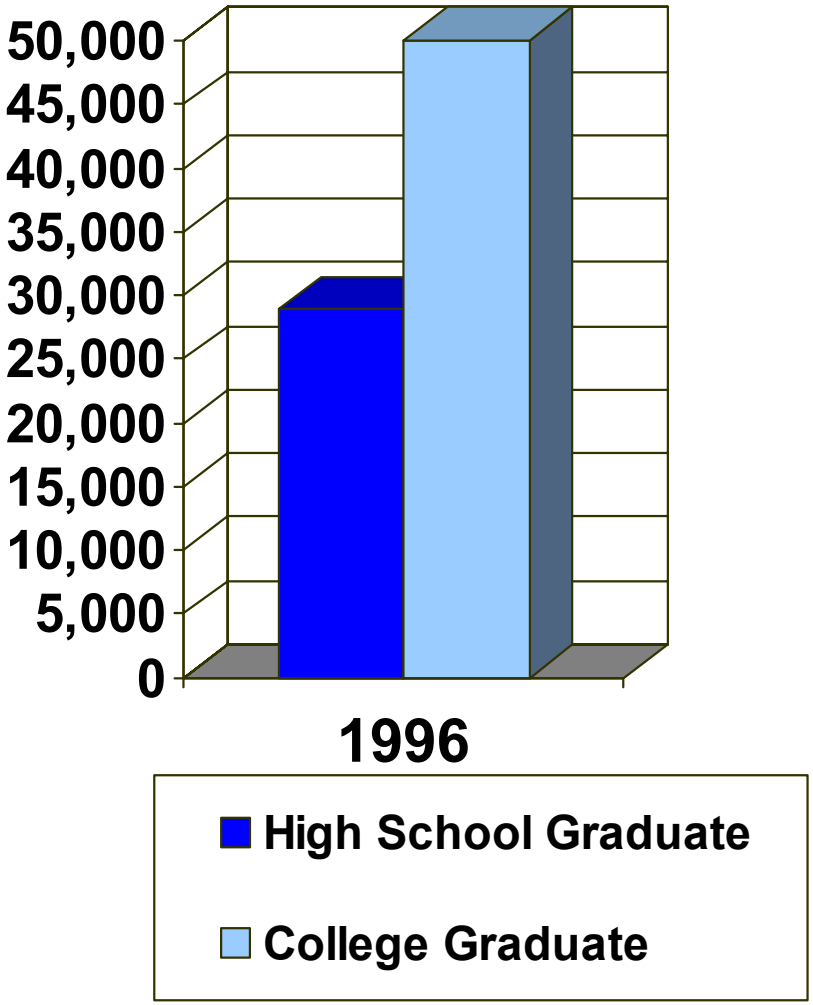


Learning and Earning

- **The *correlation* of education and earnings**
  - **"The pay gap between high school and college graduates continues to widen, doubling from a 50% premium in 1980 to 111% today."**
    (*James Duderstadt, President, University of Michigan, March 2003)*
  - **Wage gains for bachelors' degrees have leveled off in the last decade**
    (fig 1-4a The Knowledge Economy - National Research Council)
- **The correlation of national and community economic development with education**
  - **The American economy continues to do well, with**
    - **The second highest per capita income**
    - **Lower unemployment than Europe, the OECD, and, over the last decade, even Japan**
  - **However, we are losing ground as far as training for a high tech economy**

Learning & Earnings Statistics

- **In 1996 the average working age male who had completed high school earned $28,878**
- **In 1996 the average working age male college graduate earned $50,000**



Comparison of Median Annual Earnings with Level of Education Attained for 1970-1998

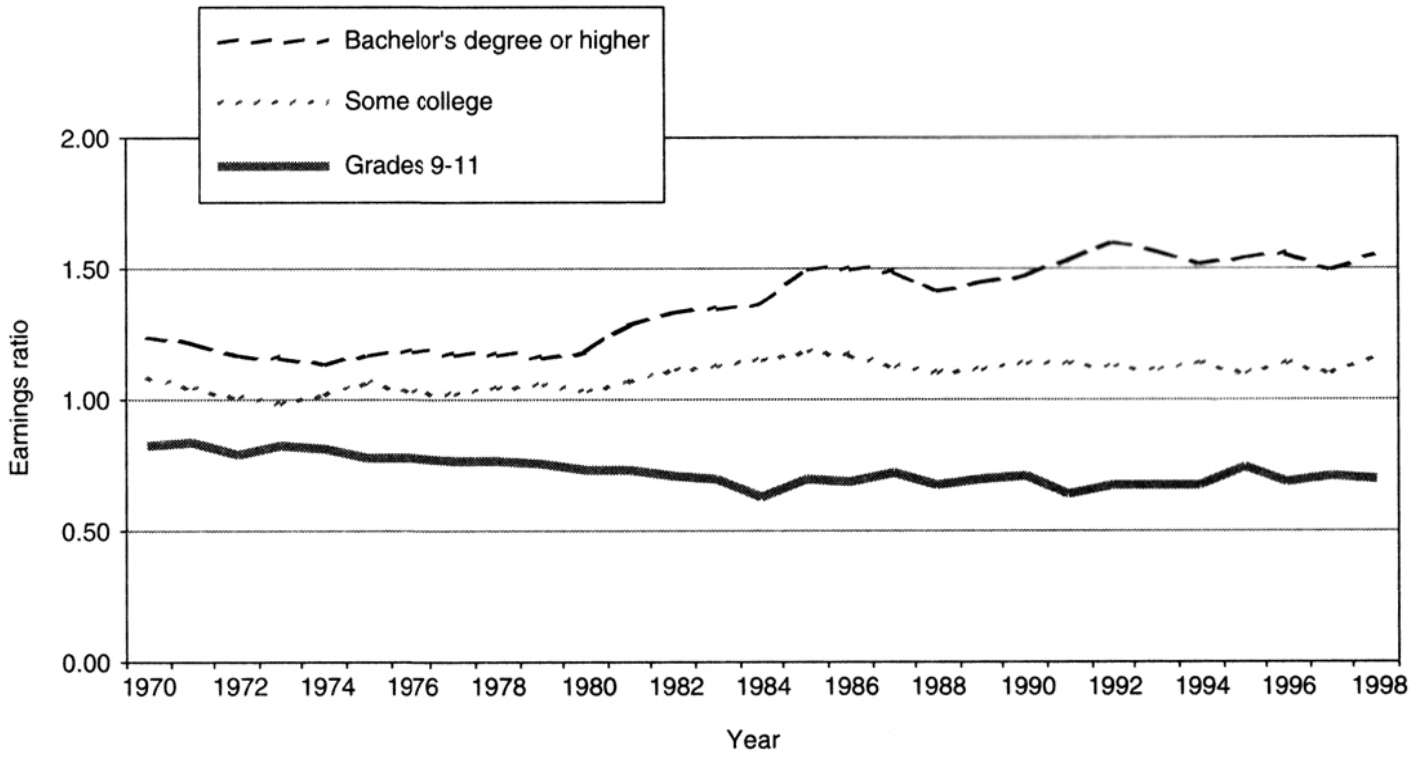


FIGURE 1-4a Ratio of median annual earnings of male wage and salary workers aged 25–34 whose highest education level was grades 9–11, some college, or a bachelor's degree or higher, compared to those whose highest education was a high school diploma or GED: 1970–1998.

SOURCE: National Center for Education Statistics (2000, p. 144).

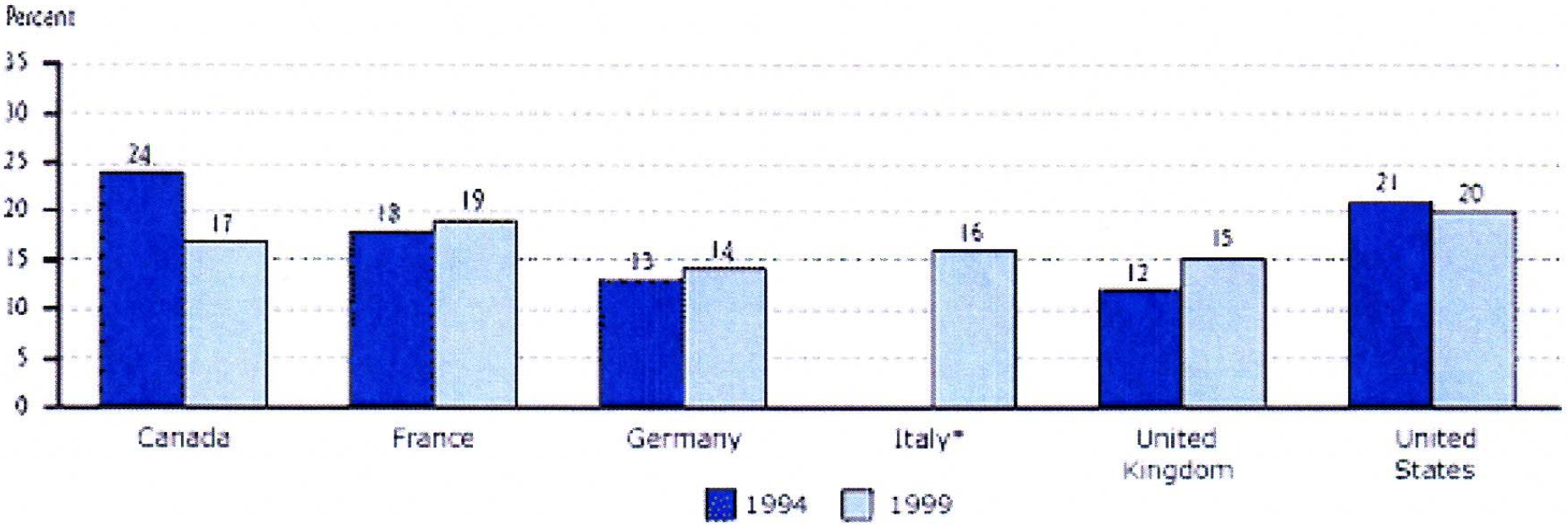
Participation Rates

- **“In 1999 the United States had a full-time and part-time enrollment rate of 20% in higher education for adults 18-29…..higher in the U.S. than in the other six countries presented.”**

  (fig 1a NCES International Education Indicators)

Percentage of the population ages 18-29 enrolled in higher education by country

Figure 1a: Percentage of the population ages 18 to 29 enrolled in higher education, by country: 1994 and 1999



U.S. Population

- **1992-1999 population growth**
  - **U.S. 11%**
  - **Germany 7**
  - **Canada 7**
  - **U.K. 5**
  - **France -2**
  - **Russia -3**
  - **Italy -16**
  - **Japan -18**
- **From immigration and natural increase, the school age population, and therefore the challenge, is growing faster in the U.S. than in the G-8**
- **In the long run, though, the demographic challenge through aging populations is much greater, and a much larger problem for the other G-8 countries**

Graduation Rates - High School

- **87% of U.S. pop. 25-64 has completed upper secondary (high school), "a higher percentage than in the other countries presented"**

- **Age 25-34 high school graduation rates**
  - **Japan 93%**
  - **U.S. 88**
  - **Canada 87**
  - **Germany 85**
  - **France 76**
  - **U.K. 66**
  - **Italy 55**

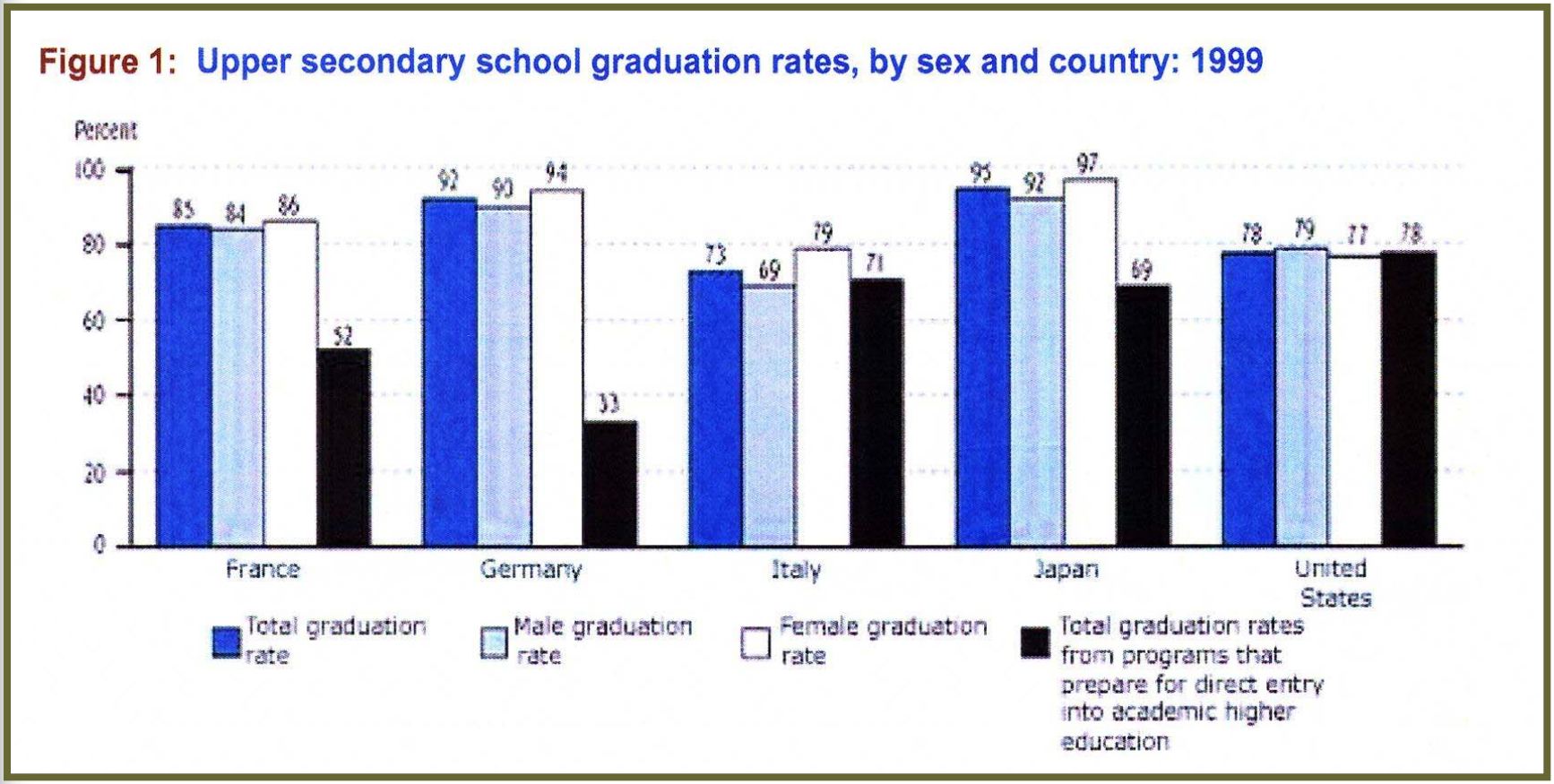
Graduation Rates - College

- Age 25-64 first university degree
  - U.S. 27%
  - Canada 19
  - Japan 18
  - U.K. 17
  - Germany 13
  - France 11
  - Italy 9
- Age 25-34 college degree
  - U.S. 29%
  - Canada 23
  - Japan 23
  - U.K. 19
  - France 15
  - Germany 13
  - Italy 10

- Gross graduation rate from 3-5 year first university programs (BA) in 1999
  - U.K. 37%
  - U.S. 33
  - Japan 29
  - Canada 27
  - Russia 26
  - France 19 (25% with 5-6yr)
  - Germany 5 (16% with 5-6yr)
  - Italy 1

- In Japan and to a lesser extent in Germany these degrees are vocational - a majority of them in Japan. One needs to remember that in interpreting these numbers.

Upper secondary school graduation rates, by sex and country



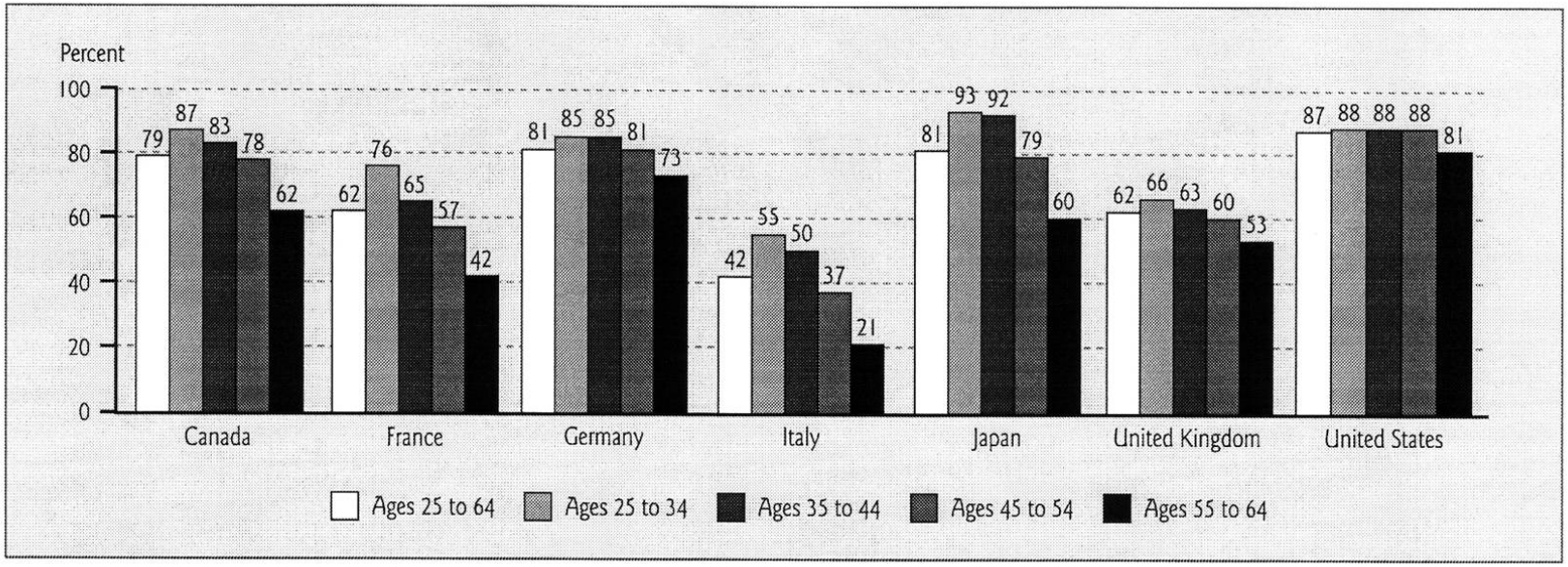
The U.S. is significantly higher on the academic track: the higher skills

College Degrees Compared

- **The U.S. is fifth among G-8 countries in Science degrees**
  - **U.K. 16%**
  - **France 15**
  - **Germany 12**
  - **Canada 12**
  - **U.S. 11**
  - **Italy 9**
  - **Japan 4**
- **The U.S. is LAST, *dead last*, in Math**
  - **Italy 22%**
  - **Germany 17**
  - **Canada 12**
  - **U.K. 11**
  - **U.S. 10**

Percentage of the population 25 to 64 that has completed at least a first university degree, by age group and country

Figure 2a. Percentage of the population ages 25 to 64 that has completed at least an upper secondary education, by age group and country: 1999

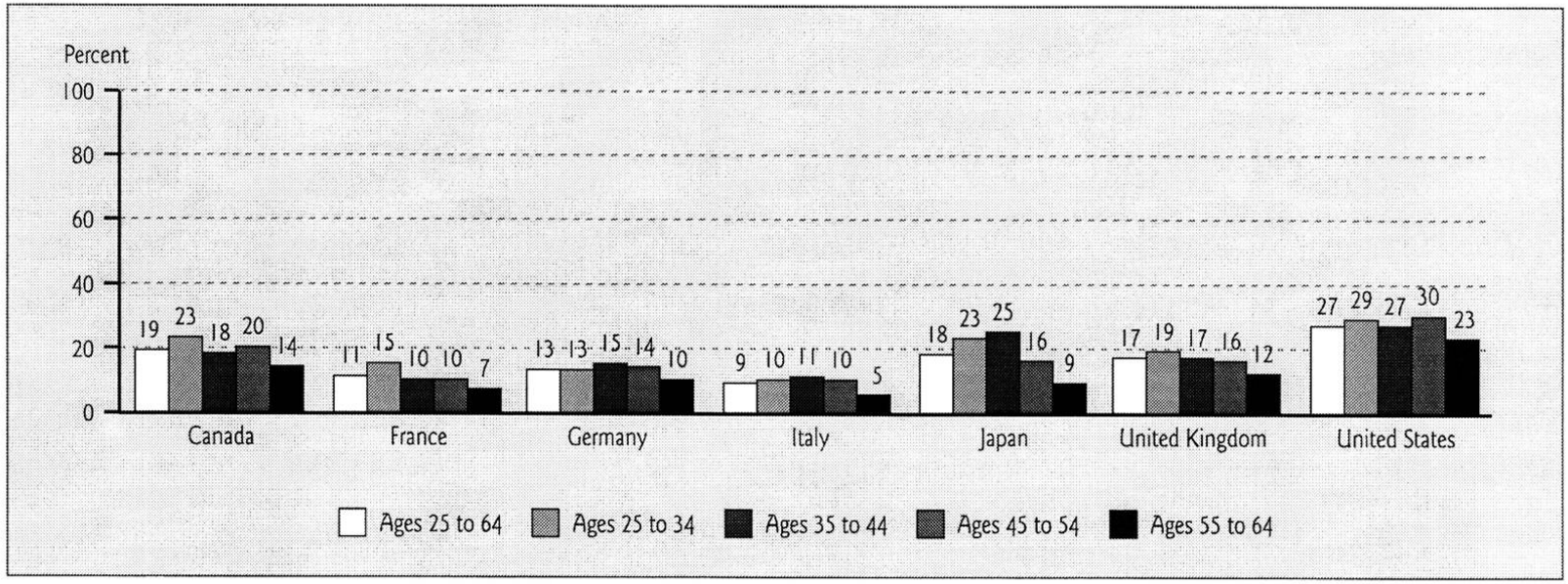


NOTE: The United Kingdom includes England, Northern Ireland, Scotland, and Wales. Data for the United Kingdom exclude individuals who have completed short programs that do not provide access to higher education, since these programs do not meet the minimum requirements to qualify as upper secondary education based on the international standard (ISCED). Data for the United States include individuals who have completed both a high school diploma and a General Educational Development (GED) award.

SOURCE: Organization for Economic Cooperation and Development, *Education at a Glance*, 2001, Table A 2.2a.

Percentage of the population 25 to 64 that has completed at least an upper secondary education, by age group and country

Figure 2b. Percentage of the population ages 25 to 64 that has completed at least a first university degree, by age group and country: 1999

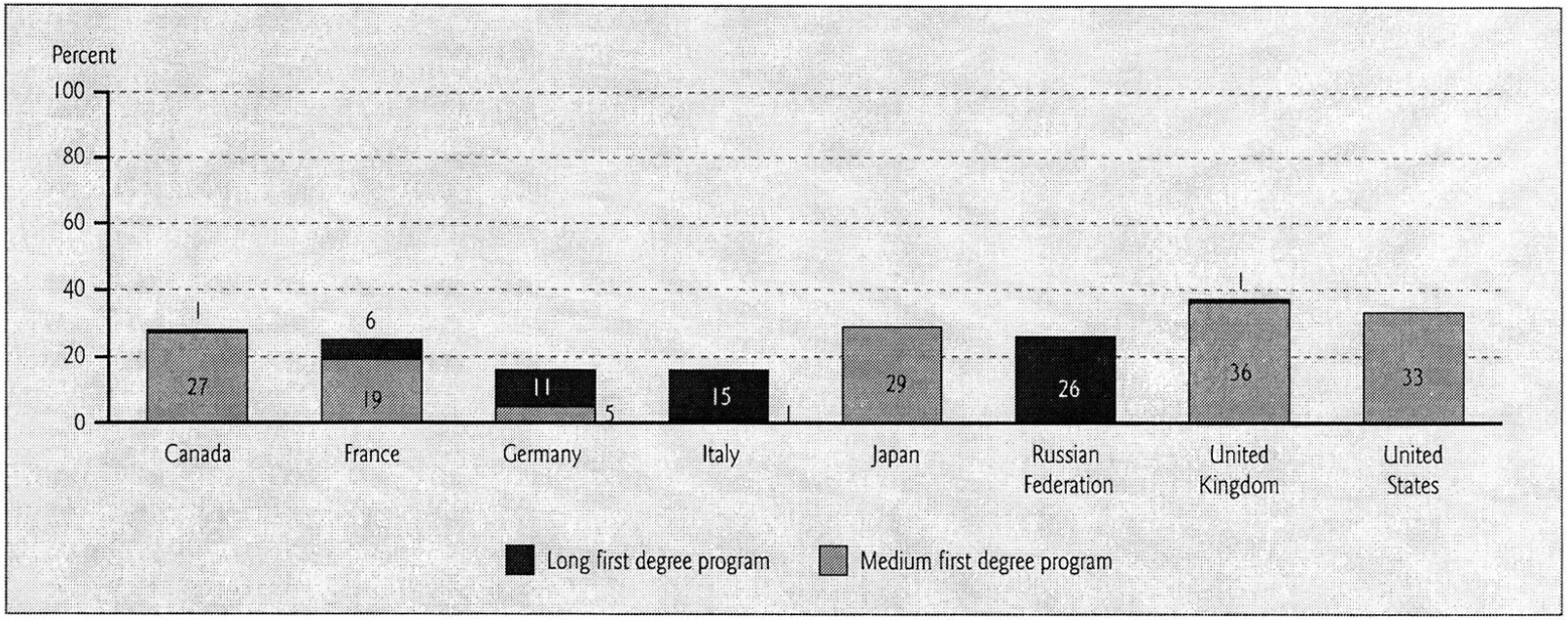


NOTE: The United Kingdom includes England, Northern Ireland, Scotland, and Wales. Data for the United Kingdom exclude individuals who have completed short programs that do not provide access to higher education, since these programs do not meet the minimum requirements to qualify as upper secondary education based on the international standard (ISCED).

SOURCE: Organization for Economic Cooperation and Development, *Education at a Glance*, 2001, Table A 2.2b.

Graduation rates in higher education, by length and country

Figure 25a. Graduation rates in higher education, by length of program and country: 1999

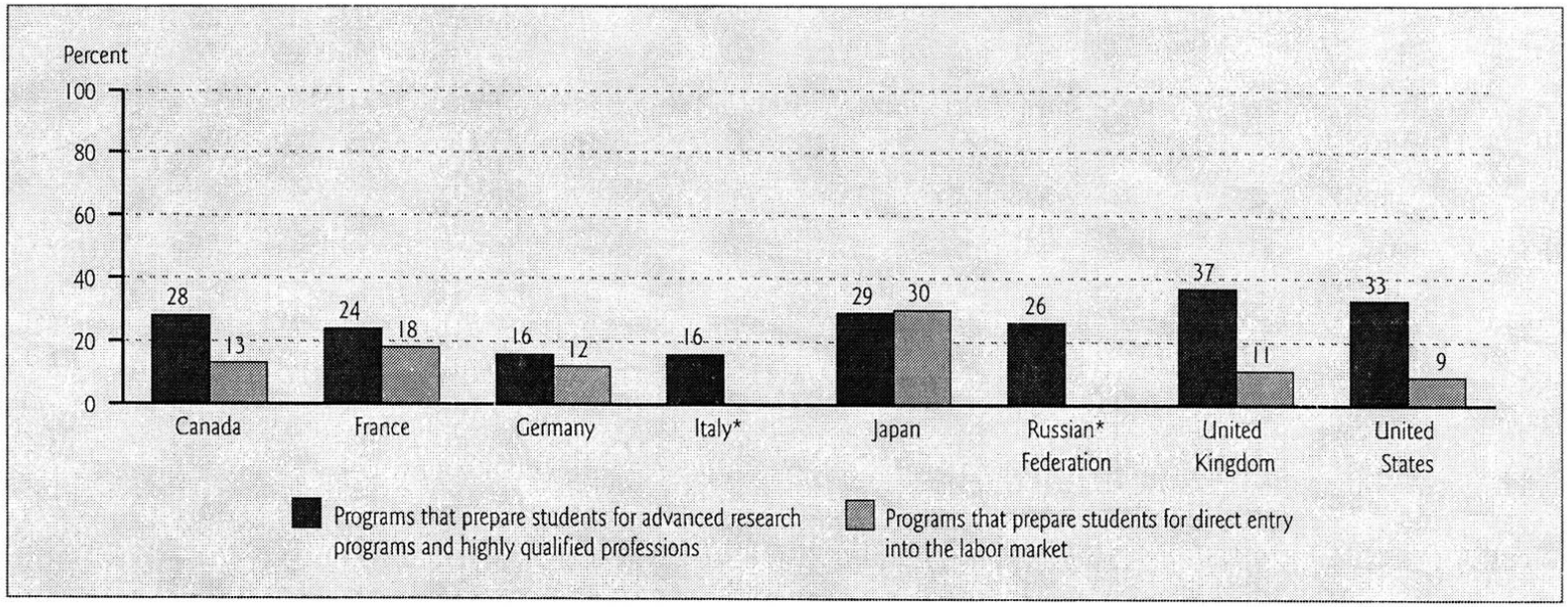


NOTE: The United Kingdom includes England, Northern Ireland, Scotland, and Wales. Medium first degree program data not available for the Russian Federation. Long first degree program data not applicable for Japan and not available for the United States. Programs that prepare students for advanced research and highly qualified professions are classified as first university degree programs. In the United States, the first university degree corresponds to a bachelor's degree. As a bachelor's degree is typically of 4 years' duration, it is classified as a medium length first degree. First university degrees exclude associate's degrees. Gross graduation rates are reported for France, Japan, the Russian Federation, and the United States; net graduation rates are reported for Canada, Germany, Italy, and the United Kingdom.

SOURCE: Organization for Economic Cooperation and Development, *Education at a Glance*, 2001, Table C 4.1.

Graduation rates in higher education, by type of program and country

Figure 25b. Graduation rates in higher education, by type of program and country: 1999



*The graduation ratio for programs that prepare students for direct entry into the labor market in Italy rounds to zero; data on programs that prepare students for direct entry into the labor market are not available for the Russian Federation.

NOTE: The United Kingdom includes England, Northern Ireland, Scotland, and Wales. Programs that prepare students for advanced research and highly qualified professions are classified as first university degree programs. In the United States, the first university degree corresponds to a bachelor's degree. As a bachelor's degree is typically of 4 years' duration, it is classified as a medium length first degree. First university degrees exclude associate's degrees. Gross graduation rates are reported for France, Japan, the Russian Federation, and the United States; net graduation rates are reported for Canada, Germany, Italy, and the United Kingdom.

SOURCE: Organization for Economic Cooperation and Development, *Education at a Glance*, 2001, Table C 4.1.

Significant Qualification

- **Many OECD countries (Ireland, UK, France, etc.) track students earlier and to a much more significant degree than the U.S. in vocational, apprenticeship, and specialist directions**

Graduation Rates - Case Studies

- **Finland and New Zealand are worth examining**
  - **They have high graduation rates and high skill levels on international normed tests**
  - **Their economies are vibrant and export-oriented**
  - **Finland, with its relatively homogenous population, has an unusually focused economy - telecommunications**
  - **New Zealand, with more diversity resulting from its large indigenous Maori population, has a more diverse economy including a large agricultural sector**
  - **Both have focused on universal quality in skill levels**
  - **Both have dynamic, very market-oriented economies, with New Zealand having the least-regulated economy in the world**
  - **Both have surpassed the U.S. in graduation rates, skills, and export led economic activity**

Lessons From Finland and New Zealand

- **Consider the reverse side of the correlation between education and income—the economy**
  - **The stimulus is perhaps from the growth of the demand for highly-skilled workers in a dynamic economy instead of the supply of educated workers creating economic health**
  - **Perhaps a low tax, deregulated economic environment like New Zealand's stimulates educational achievement**
  - **Highly regulated environments like Germany and France are still significantly behind the U.S. in graduation rates, and not doing much better, if at all, in skill levels**

The National Debate

- **Standards and Resources**
- **Skills and Graduation Rates**

Where does Missouri fit in all this?

- **U.S. expenditures per pupil are 60% higher than OECD average**
- **Missouri expenditures are slightly below U.S. average**
- **Missouri expenditures are still significantly higher than OECD average**
- **As a separate country, Missouri would rank 3rd in expenditure per pupil in higher education**
  - **Obviously a number of other states rank higher than Missouri and would rank higher in a global competitiveness scale**
  - **But the point needs to be emphasized that, relative to global competition and in terms of the expenditure of resources, Missouri is in very good shape**

Graduation Rates (Again)

- **OECD graduation rates**
- **U.S. graduation rates**
- **Missouri graduation rates**

Graduation Rates (Again)

- **The Europeans and the Asian tigers are achieving parity with the U.S. in terms of graduation rates despite the significantly greater expenditure of money in the U.S.**
- **Missouri has a significantly higher graduation rate from high school than the U.S. average or the OECD average - 93%**
- **Significant qualifiers**
  - **The structure of European education**
  - **The length of time it takes U.S. students to graduate**
  - **Reporting difficulties, particularly in urban school districts**

Missouri Graduation Rates

- **Missouri's HS graduation rate ranks 13th nationally at 88.1% vs. 84.1% for U.S. average**
- **Missouri's 6-year graduation rate is 52.2% vs. U.S. average of 54.6% - ranking 25th (from NCHMS website)**
- **Missouri's 6-year rate for bachelors' degrees is 58.5% vs. U.S. average of 50.8% - ranking 11th**

  (from *Measuring Up*)
- **Despite variations, certain things are clear**
  - **Missouri's graduation rate is high**
  - **It takes longer in the U.S. as well as Missouri to get through school**
  - **Missouri's college graduation rates are good or very good depending on which one of many statistics you use**

Missouri Graduation Rates

- **What is not clear is that we have the brain drain that Dennis Jones has alluded to with the 200,000+ Missourians leaving the state**
- **Another point that appears to be true is that we do okay graduating in science and engineering, but retention is more complicated**
  - **Our average compensation doesn't look good despite a large number of engineering firms headquartered here**
  - **It is probable that the more highly paid employees live in Johnson County, Kansas, in the Kansas City area**
  - **To a lesser extent, this occurs in Madison and St. Clair counties in Illinois affecting the St. Louis area**

    (reference conversations with Greg Graves of Burns & McDonnell and Len Rodman of Black & Veatch)

Six-Year Graduation Rates of Bachelor's Students

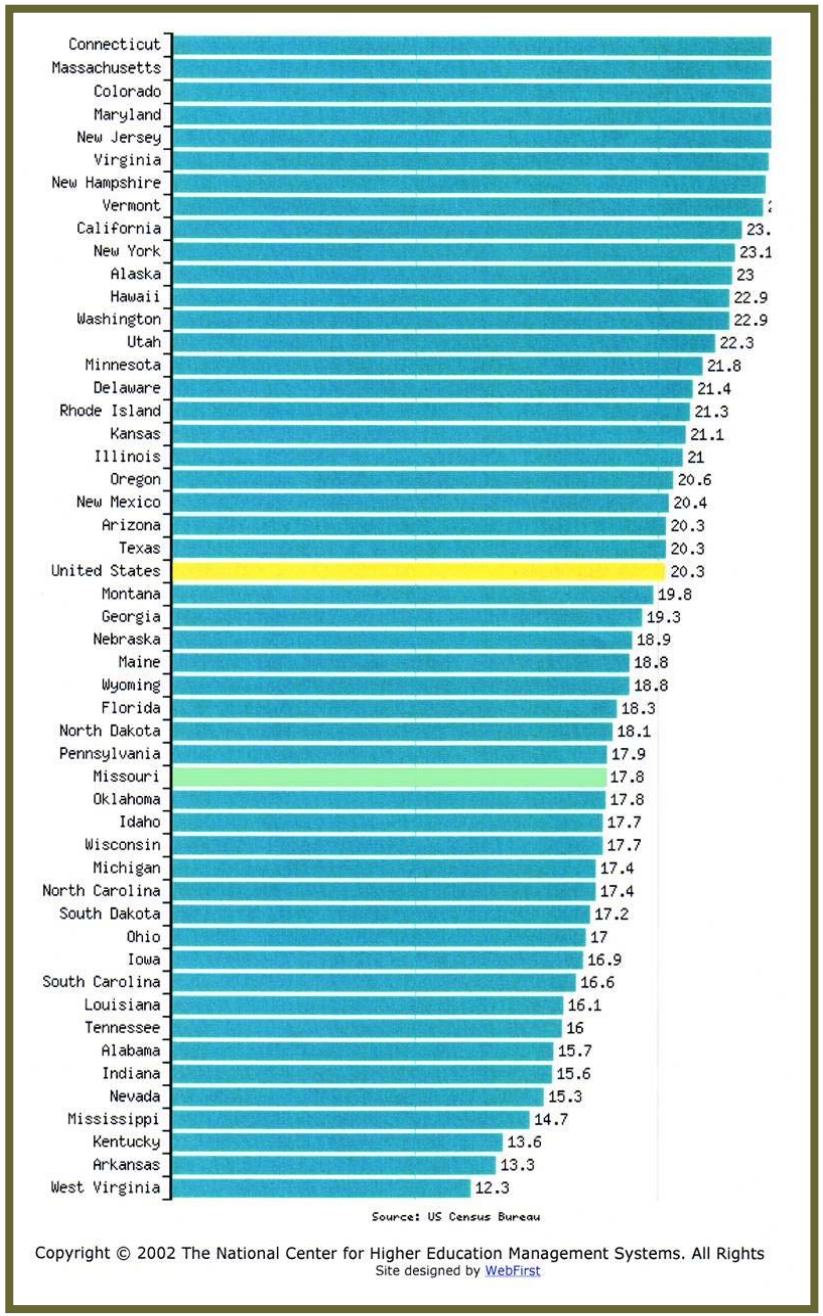
	Graduation Rate	Beginning Cohort Fall 1995	Graduated by Summer 2001	No. of Institutions	No. Responding	Percent of Institutions Responding to GRS	Total Undergrads For all Title IV 4-Year Institutions, Fall 2001	Total Undergrad Enrollment of Institutions Responding to GRS, Fall 2001	Percent of Undergrad Enrollment Covered, Fall 2001
Alabama	50.6	18306	9269	40	31	77.5	127475	118336	92.8
Alaska	44	885	389	6	6	100	24939	24939	100
Arizona	47.5	14786	7019	32	16	50	124045	113250	91.3
Arkansas	36.7	11922	4373	21	20	95.2	73369	72696	99.1
California	58.3	69452	40519	231	107	46.3	634622	608751	95.9
Colorado	49.8	17137	8541	44	24	54.5	138846	132379	95.3
Connecticut	61	12470	7603	29	23	79.3	87335	80684	92.4
Delaware	62.8	4246	2666	6	6	100	28125	28125	100
Florida	54.2	28643	15522	101	41	40.6	310103	262522	84.7
Georgia	42.2	31009	13087	67	48	71.6	197228	190549	96.6
Hawaii	45.8	3004	1375	12	6	50	27637	26351	95.3
Idaho	45.4	6247	2836	10	9	90	50252	50252	100
Illinois	57.6	39841	22960	119	57	47.9	281402	260136	92.4
Indiana	53.7	36996	19867	60	47	78.3	206197	194977	94.6
Iowa	63.2	15392	9734	44	35	79.5	99468	93381	93.9
Kansas	48.4	11774	5704	31	21	67.7	86126	81407	94.5
Kentucky	43.5	17495	7611	34	26	76.5	112935	111401	98.6
Louisiana	37	24112	8927	26	20	76.9	145484	139355	95.8
Maine	58.6	5729	3359	21	19	90.5	43082	43082	100
Maryland	60.8	13721	8338	41	24	58.5	118284	112957	95.5
Massachusetts	64	41370	26492	94	69	73.4	235697	229667	97.4
Michigan	56.9	35656	20286	75	41	54.7	295912	239027	80.8
Minnesota	55.2	23687	13067	58	41	70.7	151522	144806	95.6
Mississippi	48.6	9009	4376	20	17	85	62595	62136	99.3

Continued on next page

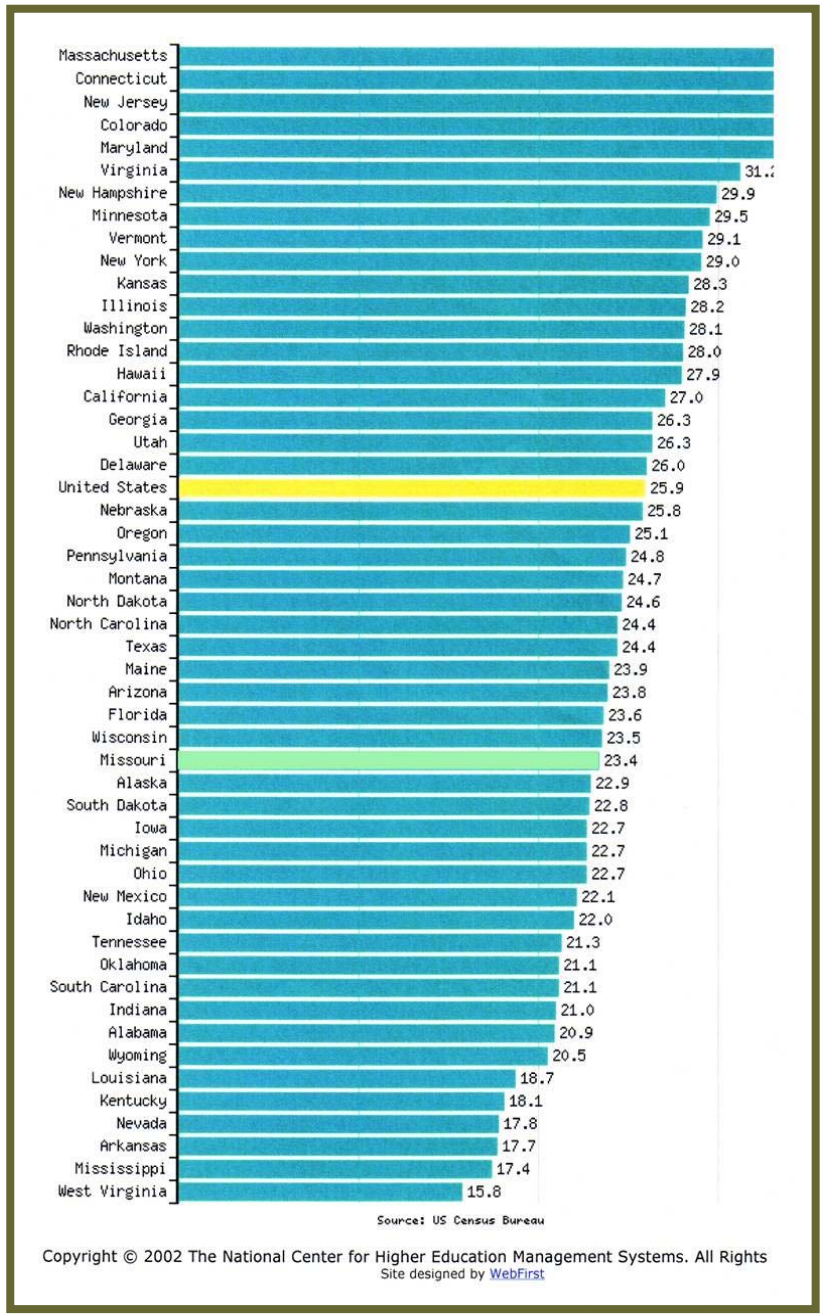
Six-Year Graduation Rates of Bachelor's Students

	Graduation Rate	Beginning Cohort Fall 1995	Graduated by Summer 2001	No. of Institutions	No. Responding	Percent of Institutions Responding to GRS	Total Undergrads For all Title IV 4-Year Institutions, Fall 2001	Total Undergrad Enrollment of Institutions Responding to GRS, Fall 2001	Percent of Undergrad Enrollment Covered, Fall 2001
Missouri	52.2	25311	13205	77	52	67.5	182370	180617	99
Montana	41.8	4844	2024	11	9	81.8	32650	31071	95.2
Nebraska	49.1	10214	5013	22	18	81.8	59388	54544	91.8
Nevada	42.5	2601	1106	7	5	71.4	34274	32775	95.6
New Hampshire	64	7637	4887	20	15	75	42534	37695	88.6
New Jersey	59.6	20820	12405	36	28	77.8	161329	150503	93.3
New Mexico	39.1	4936	1932	21	13	61.9	43250	42588	98.5
New York	54.6	61554	33631	221	103	46.6	575859	388533	67.5
North Carolina	57.7	33370	19270	57	51	89.5	195384	194032	99.3
North Dakota	42.9	4850	2082	10	9	90	29951	29860	99.7
Ohio	52.8	51259	27075	96	71	74	307863	296676	96.4
Oklahoma	41	14579	5981	34	24	70.6	102808	99373	96.7
Oregon	52.6	10266	5397	37	25	67.6	80385	74606	92.8
Pennsylvania	62.1	69112	42924	151	121	80.1	386220	380907	98.6
Rhode Island	66.3	8351	5539	13	8	61.5	50035	43373	86.7
South Carolina	54.5	16622	9051	35	29	82.9	95652	92181	96.4
South Dakota	44.7	5348	2390	20	12	60	32277	29730	92.1
Tennessee	48	21488	10304	58	40	69	142533	136182	95.5
Texas	48.2	56285	27157	101	65	64.4	449153	417707	93
Utah	48.9	11445	5591	14	12	85.7	128285	128113	99.9
Vermont	61	5706	3480	24	18	75	26395	26161	99.1
Virginia	60.3	31046	18710	68	42	61.8	180228	175713	97.5
Washington	61.9	13658	8450	41	21	51.2	109835	97168	88.5
West Virginia	40.8	11956	4877	22	19	86.4	69795	67131	96.2
Wisconsin	55.5	26846	14897	47	38	80.9	170808	170505	99.8
Wyoming	53.7	1267	680	1	1	100	8907	8907	100
Nation	**54**	**1030708**	**556215**	**2483**	**1613**	**65**	**7413080**	**6859164**	**92.5**

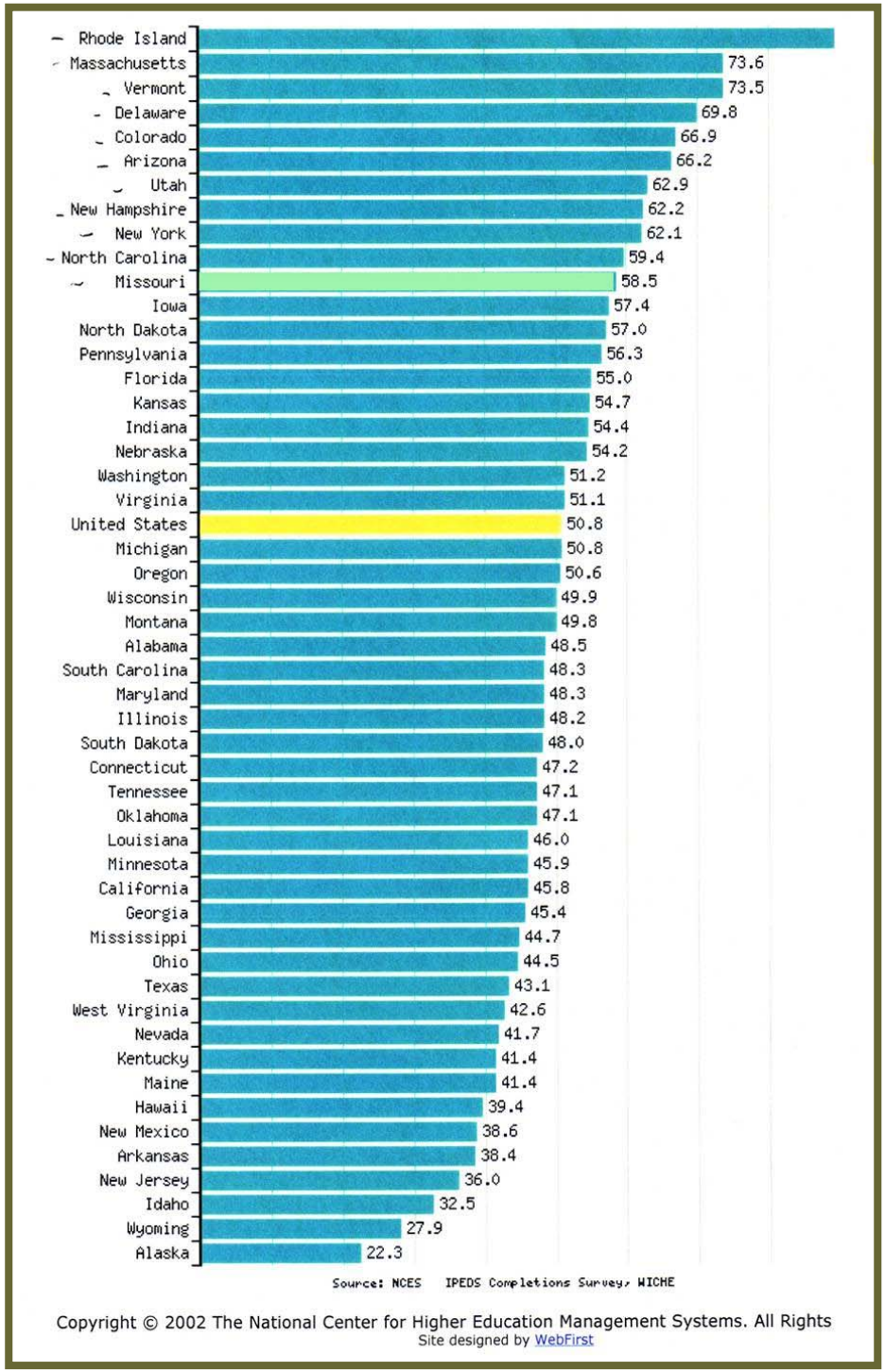
Adults with Bachelor's Degree or Higher



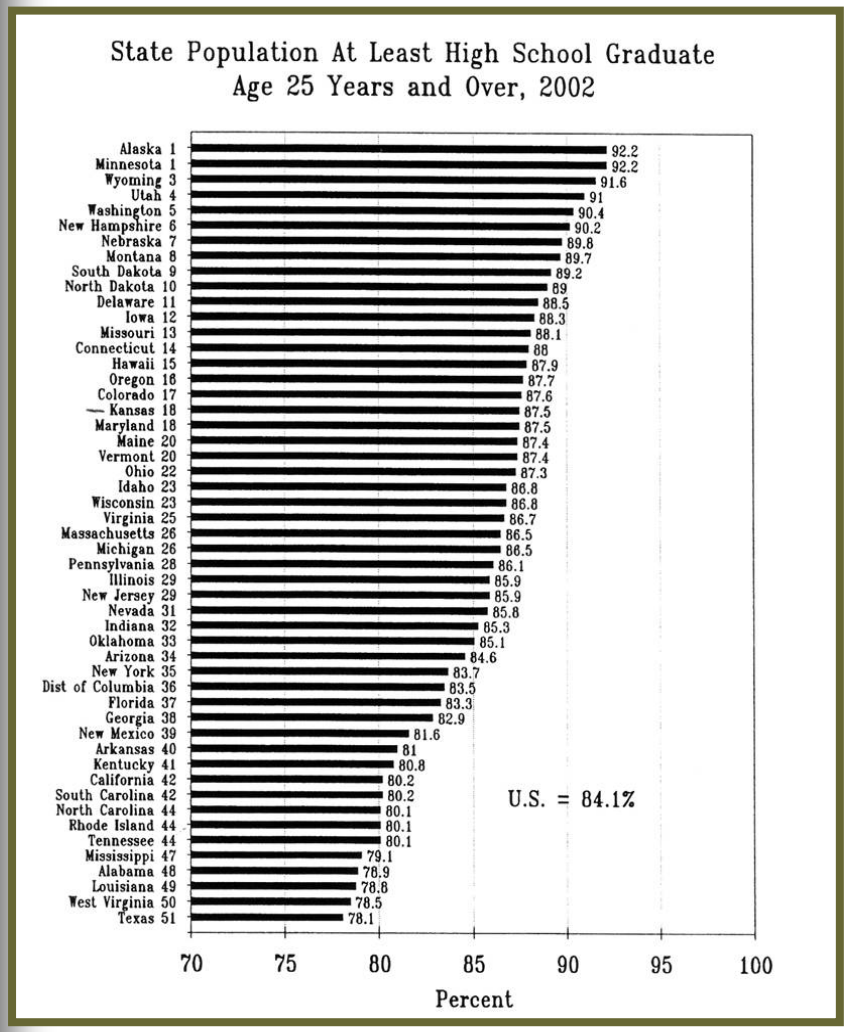
Age 25-44 with Bachelor's Degree or Higher



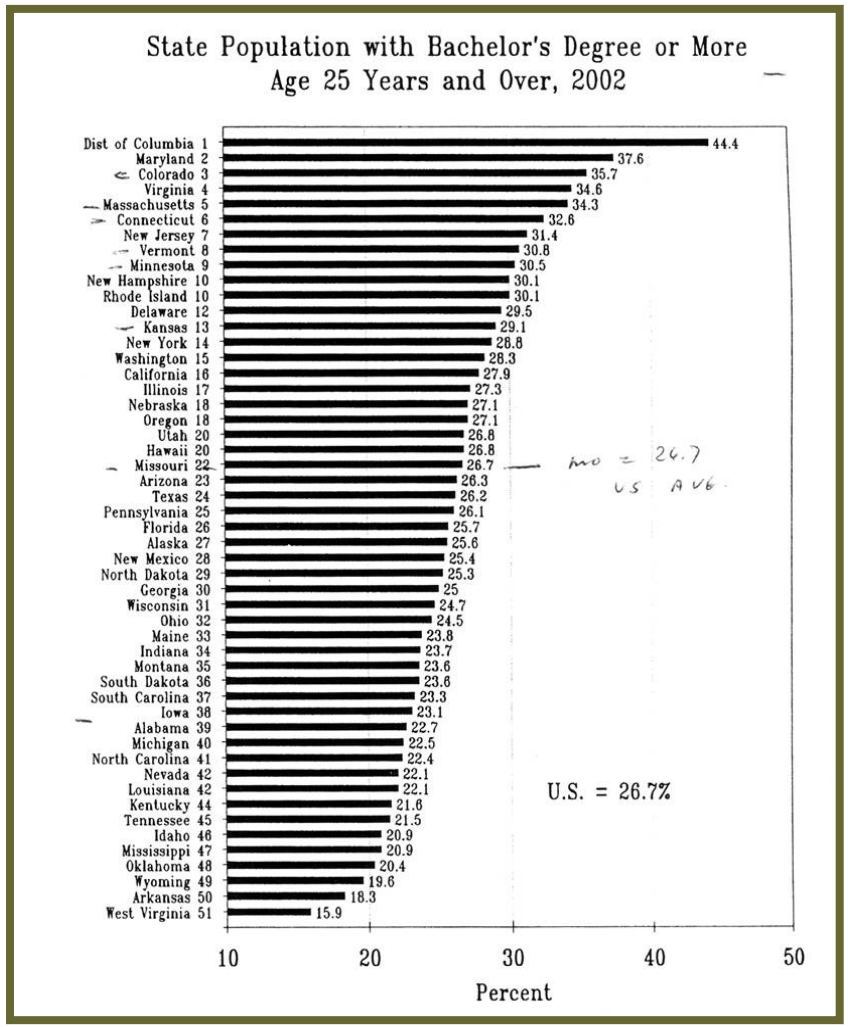
Bachelor's Degrees Awarded Per 100 HS Graduates 6 Years Later



State Population At Least HS Graduate Age 25+



State Population with Bachelor's Degree Age 25+



Persistence and Graduation (Again)

- **The problem at the national level is not that we're not graduating more people**
  - **The secular trend has been positive for thirty years - but almost all of the gains have been Asian or female (one might note the sociologically correct joke from the recent movie "School of Rock" about the graduating class being young Asian-American females)**
  - **White, black and Hispanic males have plateaued or worse**
    - **Central High and Vashon numbers would corroborate this**
    - **They have a huge decline in enrollment from freshman year to senior year**

- **"It is the failure to teach basic skills. That is the one thing we can affect through teacher education."**
  (source - National Research Council, The Knowledge Economy)

How Important Are Rates of Participation and Graduation?

- **The most important number for participation, persistence, graduation, and economic or other success in life is 0%**
  - **The number of students at or above proficient level on the NAEP test scores of Central High, the Kansas City School District's largest high school, is 0%**
  - **In St. Louis, the number for Vashon High School is also 0%**
- **The Collaborative is rightly concerned with access to higher education, but without adequate preparation there can be no opportunity to attend college, much less persistence to graduate**
- **Finally, to prove the point, when comparing educational attainment of the 36 largest metropolitan areas, only 8 have higher graduation rates than Kansas City - and this analysis includes Johnson County, Kansas**

Educational Attainment by Metropolitan Area for Population Age 25+

Table 15. Educational Attainment of the Population 25 Years and Over, By Metropolitan Area, Including Confidence Intervals of Estimates: March 2002
(Numbers in thousands)

Metropolitan Area	Total 25 years and over	Completed High School Percent	1.6*(S.E.) /1/	Bachelor's degree or more Percent	1.6*(S.E.) /1/
Atlanta, GA MSA	2,736	87.7	1.5	34.9	2.2
Boston-Law., MA-NH-ME-CT CMSA	4,049	87.7	0.9	36.0	1.3
.Boston, MA-NH PMSA	2,405	88.8	1.2	41.1	1.8
Buffalo-Niagara Falls, NY MSA	744	86.4	2.4	24.2	3.0
Charlotte-Gastonia, NC-SC MSA	965	79.3	2.8	23.4	3.0
Chicago-Gary-Ken., IL-IN-WI CMSA	5,723	86.1	0.9	31.7	1.2
.Chicago, IL PMSA	5,321	86.1	0.9	32.3	1.2
Cincinnati-Hamil., OH-KY-IN CMSA	1,241	84.8	2.0	30.3	2.5
.Cincinnati, OH-KY-IN PMSA	1,082	84.7	2.1	31.0	2.7
Cleveland-Akron, OH CMSA	2,144	90.8	1.2	26.8	1.8
.Cleveland-Lor.-Elyria, OH PMSA	1,669	90.0	1.4	25.0	2.0
Columbus, OH MSA	992	88.9	1.9	33.7	2.9
Dallas-Fort Worth, TX CMSA	3,391	82.1	1.5	31.1	1.8
.Dallas-TX PMSA	2,286	80.9	1.9	33.5	2.3
.Fort Worth-Arlington, TX PMSA	1,105	84.7	2.4	26.0	2.9
Denver-Boulder-Greeley CO CMSA	1,780	87.2	1.2	38.0	1.7
.Denver, CO PMSA	1,384	88.1	1.3	37.4	1.9
Detroit-Ann Arbor-Flint, MI CMSA	3,809	86.1	1.0	25.2	1.3
.Detroit, MI PMSA	3,128	86.2	1.1	24.3	1.4
Hartford, CT MSA	784	87.2	1.5	29.8	2.0
Houston-Galveston-Braz., TX CMSA	3,043	80.0	1.8	29.0	2.0
.Houston, TX PMSA	2,694	79.6	1.8	30.0	2.1
Indianapolis, IN MSA	1,084	89.5	1.6	35.4	2.5
Kansas City, MO-KS MSA	1,159	91.5	1.2	32.4	2.1
Los Angeles-Riv.-Orange, CA CMSA	10,234	77.3	0.9	26.3	0.9
.LA-Long Beach, CA PMSA	6,041	73.7	1.0	27.5	1.1
.Orange County, CA PMSA	1,794	85.5	2.0	33.9	2.7
.Riverside-San Bern., CA PMSA	1,939	79.6	2.2	15.3	1.9
Miami-Fort Lauderdale, FL CMSA	2,642	81.4	1.5	27.1	1.7
.Ft Lauderdale, FL PMSA	1,209	87.4	1.9	28.0	2.6
.Miami, FL-PMSA	1,433	76.3	2.1	26.4	2.2

(Continued)

/1/ 1.645 times the standard error added to or subtracted from the estimate provides the 90 percent confidence interval.

Kansas City - 91.5% HS Graduates and 32.4% College Degrees

Table 15. Educational Attainment of the Population 25 Years and Over, By Metropolitan Area, Including Confide
Intervals of Estimates: March 2002
(Numbers in thousands)

Metropolitan Area	Total 25 years and over	Completed High School Percent	1.6*(S.E.) /1/	Bachelor's degree or more Percent
Milwaukee-Racine, WI CMSA	1,211	84.5	1.7	28.3
.Milwaukee-Waukesha, WI PMSA	969	85.4	1.8	30.5
Minneapolis-St. Paul, MN-WI MSA	2,001	93.6	0.9	36.3
New Orleans, LA MSA	862	84.4	2.4	32.6
NY-Nor. NJ-LI, NY-NJ-CT-PA CMSA	14,156	83.8	0.6	32.2
.Bergen-Passaic, NJ PMSA	928	85.1	1.9	30.9
.Nassau-Suffolk, NY PMSA	1,869	91.5	1.2	32.3
.New York, NY PMSA	6,013	78.6	1.0	30.8
.Newark, NJ PMSA	1,484	83.4	1.7	33.7
Norfolk-VA Beach, VA-NC MSA	994	89.2	2.1	29.5
Phil.-Atl. City, PA-NJ-DE-MD CMSA	4,274	87.0	0.9	30.5
.Philadelphia, PA-NJ PMSA	3,451	87.0	1.0	31.2
Phoenix-Mesa, AZ MSA	1,964	85.5	1.6	28.2
Pittsburgh, PA MSA	1,672	90.4	1.3	30.6
Portland-Salem, OR-WA CMSA	1,559	89.8	1.1	29.2
.Portland-Vanc., OR-WA PMSA	1,342	90.4	1.2	32.1
Providence-Fall River, RI-MA MSA	797	79.5	1.1	26.7
Sacramento-Yolo, CA CMSA	1,203	91.2	1.9	28.2
St. Louis, MO-IL MSA	1,680	87.7	1.4	30.5
Salt Lake City-Odgen, UT MSA	798	92.0	1.2	27.4
San Antonio, TX MSA	1,080	78.6	2.6	26.4
San Diego, CA MSA	1,681	85.6	2.0	32.0
San Fran-Oaklnd-San Jose, CA CMSA	4,421	88.6	1.2	39.5
.Oakland, CA PMSA	1,412	91.8	1.7	37.3
.San Francisco, CA PMSA	1,252	86.9	2.2	45.1
.San Jose, CA PMSA	1,152	87.6	2.3	44.1
Seattle-Tacoma-Brem., WA CMSA	2,306	92.2	1.1	33.5
.Seattle-Bellevue, WA PMSA	1,626	93.0	1.3	37.0
Tampa-St. Petersburg-Clrwtr, FL MSA	1,838	84.6	1.7	26.3
Washington, DC-MD-VA-WV CMSA	5,157	89.3	0.6	43.1
.Baltimore, MD PMSA	1,546	87.3	1.5	33.9
.Wash. DC-MD-VA-WV PMSA	3,413	90.9	0.7	48.9

/1/ 1.645 times the standard error added to or subtracted from the estimate provides the 90 percent confidence interval.
Source: U.S. Census Bureau
Internet Release date: March 21, 2003

St. Louis - 87.7% HS Graduates and 30.5% College Degrees

Missouri Expenditures

- **Because of our aging population and riskier behaviors, Missouri spends a higher percentage of its state budget on health care**
- **Because of (easing) crime problems in our two big cities and the methamphetamine epidemic in southern Missouri, we spend more on prisons and law enforcement**
- **Because of our long-standing preference we spend more on conservation per capita than virtually any other lower 48 states**

Missouri Expenditures for Education

- **Our expenditure per pupil in elementary and secondary school is approximately $6700**
  - **Ranking 32nd in the U.S.**
  - **About $600 under the U.S. average**
- **If you factor in Missouri's positive cost-of-living index, we would approach the U.S. median in expenditure per pupil**
- **In higher education, the numbers' comparison becomes more complex**

Missouri Expenditures for Higher Education

- **Unrestricted spending per student in the University of Missouri system was $22,310 in 2002**
  - **About 10% above the national average**
  - **About 100% above the OECD average**
- **Unrestricted spending per student on all 13 public campuses in Missouri is $15,812**
  - **About 50% above the OECD average**
- **Over the five years from 1998-2002 this expenditure has grown 10% - just about equal to the CPI**
  - **Higher than the growth in personal income of 9% for the same period**
  - **The very recent decline in state support has for the most part been made up in tuition increases**
- **Adding in the private institutions, we are very close to the national average expenditure per student**

Comparison of Unrestricted Expenditures

COMPARISON OF UNRESTRICTED EXPENDITURES

This appendix shows similar trends in both the total unrestricted expenditures and these expenditures per FTE student. Table III.1 shows the total unrestricted expenditures by the 13 schools. Table III.2 shows the same expenditures per FTE students.

Table III.1: Total Unrestricted Expenditures by Fiscal Year (Dollars in thousands)

Institution	1998	2001	2002	Percent increase 1-year	Percent increase 5-year
Harris-Stowe State College	$11,080	$13,786	$13,097	-5	18
Missouri Southern State College	30,750	36,337	36,137	-1	18
Missouri Western State College	29,687	36,428	35,945	-1	21
Central Missouri State University	80,472	95,267	103,721	9	29
Northwest Missouri State University	44,323	59,989	57,698	-4	30
Southeast Missouri State University	67,706	80,412	81,885	2	21
Southwest Missouri State University	126,708	152,116	154,469	2	22
Truman State University	61,780	73,685	70,772	-4	15
Lincoln University	22,634	25,817	29,199	13	29
University of Missouri[1]	819,342	916,328	929,895	1	13
Avg. (all 13 schools)	99,576	114,628	116,371	2	17
Avg. (excluding UM campuses)	52,793	63,760	64,769	4	23
HEPI				3	15
CPI				1	10
Personal Income				3	9

[1]Includes all 4 campuses

Source: Prepared by SAO based on DHE expenditure data.

Table III.2: Total Unrestricted Expenditures Per FTE Student by Fiscal Year

Institution	1998	2001	2002	Percent increase 1-year	Percent increase 5-year
Harris-Stowe State College	$10,036	$13,320	$12,462	-6	24
Missouri Southern State College	7,351	8,408	8,191	-3	11
Missouri Western State College	7,390	9,021	8,782	-3	19
Central Missouri State University	9,773	11,188	12,267	10	26
Northwest Missouri State University	8,576	11,329	10,761	-5	25
Southeast Missouri State University	10,611	11,888	11,630	-2	10
Southwest Missouri State University	9,747	10,779	10,730	0	10
Truman State University	10,003	12,663	12,371	-2	24
Lincoln University	10,567	10,829	12,091	12	14
University of Missouri[1]	21,003	22,327	22,310	0	6
All 13 schools	14,346	15,811	15,812	0	10
All schools excluding UM campuses	9,276	10,785	10,796	0	16
HEPI				3	15
CPI				1	10
Personal Income				3	9

[1]Includes all 4 campuses

MEMBERSHIP

	Total population (in thousands)		Students in public schools		Students in first grade		Regular high school graduates (1995-96)	
	United States	265,179	United States	45,611,046	United States	3,770,420	United States	2,273,109
1	California	31,858	California	5,686,198	California	491,159	California	259,071
2	Texas	19,091	Texas	3,828,975	Texas	312,533	Texas	171,844
3	New York	18,134	New York	2,843,131	New York	235,237	New York	134,401
4	Florida	14,419	Florida	2,242,212	Florida	185,614	Pennsylvania	105,981
5	Pennsylvania	12,040	Illinois	1,973,040	Illinois	162,304	Illinois	104,626
6	Illinois	11,845	Ohio	1,844,698	Ohio	149,391	Ohio	102,098
7	Ohio	11,163	Pennsylvania	1,804,256	Pennsylvania	147,895	Florida	89,242
8	Michigan	9,731	Michigan	1,685,714	Michigan	142,124	Michigan	85,530
9	New Jersey	8,002	Georgia	1,346,761	Georgia	114,978	New Jersey	67,704
10	Georgia	7,334	New Jersey	1,227,832	North Carolina	105,756	Virginia	58,166
11	North Carolina	7,309	North Carolina	1,210,108	New Jersey	104,581	North Carolina	57,014
12	Virginia	6,666	Virginia	1,096,093	Virginia	91,234	Indiana	56,330
13	Massachusetts	6,085	Indiana	982,876	Indiana	82,221	Georgia	56,271
14	Indiana	5,828	Washington	974,504	Massachusetts	81,375	Wisconsin	52,651
15	Washington	5,520	Massachusetts	933,898	Washington	78,077	Minnesota	50,481
16	Missouri	5,364	Tennessee	904,818	Tennessee	77,450	Washington	49,862
17	Tennessee	5,307	Missouri	900,517	Missouri	70,875	Missouri	49,011
18	Wisconsin	5,146	Wisconsin	879,259	Arizona	70,180	Massachusetts	47,993
19	Maryland	5,060	Minnesota	847,204	Maryland	68,645	Tennessee	43,792
20	Minnesota	4,649	Maryland	818,583	Wisconsin	64,925	Maryland	41,785
21	Arizona	4,434	Arizona	799,250	Minnesota	64,508	Kentucky	36,641
22	Louisiana	4,341	Louisiana	793,296	Louisiana	64,136	Louisiana	36,467
23	Alabama	4,287	Alabama	747,932	Alabama	63,665	Alabama	35,043
24	Kentucky	3,882	Colorado	673,438	Colorado	54,565	Oklahoma	33,060
25	Colorado	3,816	Kentucky	656,089	Oklahoma	54,554	Colorado	32,608
26	South Carolina	3,717	South Carolina	652,816	South Carolina	49,497	Iowa	31,689
27	Oklahoma	3,295	Oklahoma	620,695	Kentucky	48,209	South Carolina	30,182
28	Connecticut	3,267	Oregon	537,854	Connecticut	46,391	Arizona	30,008
29	Oregon	3,196	Connecticut	527,129	Mississippi	43,401	Oregon	26,570
30	Iowa	2,848	Mississippi	503,967	Oregon	42,819	Connecticut	26,319
31	Mississippi	2,711	Iowa	502,941	Arkansas	37,370	Utah	26,293
32	Kansas	2,579	Utah	481,812	Iowa	36,614	Kansas	25,786
33	Arkansas	2,506	Kansas	466,293	Kansas	36,285	Arkansas	25,094
34	Utah	2,018	Arkansas	457,349	Utah	35,848	Mississippi	23,032
35	West Virginia	1,820	New Mexico	332,632	New Mexico	26,283	West Virginia	20,335
36	New Mexico	1,711	West Virginia	304,052	Nevada	25,398	Nebraska	18,014
37	Nebraska	1,649	Nebraska	291,967	West Virginia	23,092	New Mexico	15,402
38	Nevada	1,601	Nevada	282,131	Nebraska	22,224	Idaho	14,667
39	Maine	1,239	Idaho	245,252	Idaho	18,805	Maine	11,795
40	Idaho	1,188	Maine	213,593	New Hampshire	18,322	Nevada	10,374
41	Hawaii	1,183	New Hampshire	198,308	Maine	17,116	Montana	10,139
42	New Hampshire	1,160	Hawaii	187,653	Hawaii	16,683	New Hampshire	10,094
43	Rhode Island	988	Montana	164,627	Rhode Island	13,177	Hawaii	9,387
44	Montana	877	Rhode Island	151,324	Montana	12,706	South Dakota	8,532
45	South Dakota	738	South Dakota	143,331	Alaska	10,670	North Dakota	8,027
46	Delaware	723	Alaska	129,919	South Dakota	10,625	Rhode Island	7,689
47	North Dakota	643	North Dakota	120,123	Delaware	8,831	Alaska	5,945
48	Alaska	605	Delaware	110,549	North Dakota	8,788	Wyoming	5,892
49	Vermont	586	Vermont	106,341	Vermont	8,256	Vermont	5,867
50	Dist. of Columbia	539	Wyoming	99,058	Dist. of Columbia	7,912	Delaware	5,609
51	Wyoming	480	Dist. of Columbia	78,648	Wyoming	7,116	Dist. of Columbia	2,696

STATE PROFILES OF PUBLIC ELEMENTARY AND SECONDARY EDUCATION, 1996–97

Ranking of the States - Membership

FISCAL

	State revenue per capita		Average teacher salary		Revenue for public schools		Current expenditures per pupil in membership	
	United States	$3,884	United States	$38,436	United States	$305,051,963	United States	$5,925
1	Alaska	$15,490	Connecticut	$51,181	California	$34,477,895	New Jersey	$9,744
2	Delaware	$5,756	New Jersey	$49,786	New York	$26,564,743	Connecticut	$8,580
3	Hawaii	$5,647	Alaska	$49,140	Texas	$22,372,808	New York	$8,525
4	Wyoming	$5,334	New York	$48,000	Pennsylvania	$14,441,126	Alaska	$8,231
5	New York	$5,262	Michigan	$47,769	Florida	$13,861,434	Dist. of Columbia	$8,048
6	Minnesota	$4,883	Pennsylvania	$47,147	Michigan	$13,437,615	Rhode Island	$7,612
7	Washington	$4,784	Massachusetts	$44,101	Illinois	$13,161,954	Massachusetts	$7,331
8	New Mexico	$4,734	Rhode Island	$43,084	Ohio	$12,587,117	Delaware	$7,135
9	Michigan	$4,656	California	$42,992	New Jersey	$12,376,750	Pennsylvania	$7,106
10	Oregon	$4,626	Delaware	$42,424	Georgia	$8,129,250	Michigan	$6,938
11	Wisconsin	$4,615	Illinois	$42,339	Indiana	$7,638,406	Wisconsin	$6,796
12	New Jersey	$4,481	Dist. of Columbia	$41,436	Massachusetts	$7,229,486	Maryland	$6,755
13	Connecticut	$4,440	Maryland	$41,257	Virginia	$7,204,510	Vermont	$6,753
14	North Dakota	$4,396	Oregon	$41,093	Wisconsin	$6,701,115	Maine	$6,327
15	Massachusetts	$4,338	Nevada	$40,817	Washington	$6,642,158	Indiana	$6,157
16	Rhode Island	$4,283	Ohio	$38,944	North Carolina	$6,515,608	West Virginia	$6,076
17	Maine	$4,199	Indiana	$38,722	Minnesota	$6,109,916	Minnesota	$6,005
18	West Virginia	$4,112	Minnesota	$38,276	Maryland	$6,042,059	Wyoming	$5,971
19	Pennsylvania	$4,103	Hawaii	$38,105	Missouri	$5,571,655	Illinois	$5,940
20	California	$4,063	Wisconsin	$37,878	Connecticut	$4,899,850	Ohio	$5,936
21	Ohio	$4,045	Washington	$37,860	Tennessee	$4,411,971	Oregon	$5,920
22	Vermont	$4,024	Colorado	$36,271	Arizona	$4,400,591	New Hampshire	$5,920
23	Montana	$4,010	Virginia	$36,116	Louisiana	$4,154,494	Nebraska	$5,848
24	Maryland	$3,951	Vermont	$36,053	Colorado	$4,045,015	Virginia	$5,788
25	Nevada	$3,873	New Hampshire	$36,029	Alabama	$3,955,039	Iowa	$5,738
26	Kentucky	$3,846	Georgia	$35,679	South Carolina	$3,889,383	Washington	$5,734
27	Utah	$3,751	Tennessee	$34,267	Kentucky	$3,794,129	Hawaii	$5,633
28	South Carolina	$3,671	Florida	$33,885	Oregon	$3,472,609	Kansas	$5,508
29	Louisiana	$3,660	Kentucky	$33,802	Oklahoma	$3,251,302	Montana	$5,481
30	Virginia	$3,612	Maine	$33,676	Iowa	$3,167,763	Georgia	$5,369
31	Idaho	$3,544	Iowa	$33,272	Kansas	$3,040,600	Florida	$5,360
32	Arkansas	$3,506	West Virginia	$33,258	Arkansas	$2,371,834	Colorado	$5,312
33	Mississippi	$3,443	Arizona	$33,208	Mississippi	$2,259,053	Missouri	$5,306
34	North Carolina	$3,438	Kansas	$33,150	Utah	$2,198,285	Texas	$5,267
35	Oklahoma	$3,415	Missouri	$33,143	West Virginia	$2,082,049	California	$5,258
36	Nebraska	$3,342	South Carolina	$32,659	Nebraska	$1,954,789	Kentucky	$5,155
37	Iowa	$3,334	Alabama	$32,470	New Mexico	$1,829,725	Nevada	$5,084
38	Texas	$3,285	Texas	$32,426	Nevada	$1,705,232	South Carolina	$5,048
39	Colorado	$3,283	Idaho	$31,818	Maine	$1,499,504	North Carolina	$4,929
40	Illinois	$3,282	Nebraska	$31,768	New Hampshire	$1,282,509	Oklahoma	$4,817
41	Alabama	$3,243	Wyoming	$31,716	Idaho	$1,251,263	North Dakota	$4,808
42	Georgia	$3,210	Utah	$31,310	Alaska	$1,219,017	Louisiana	$4,724
43	South Dakota	$3,138	North Carolina	$31,167	Hawaii	$1,215,924	New Mexico	$4,682
44	Missouri	$3,073	Arkansas	$30,987	Rhode Island	$1,193,754	Alabama	$4,593
45	Kansas	$3,064	Oklahoma	$30,187	Montana	$991,653	Tennessee	$4,580
46	New Hampshire	$3,036	Montana	$29,958	Delaware	$878,326	Arkansas	$4,535
47	Arizona	$3,006	New Mexico	$29,715	Vermont	$812,166	Idaho	$4,447
48	Indiana	$2,991	Louisiana	$28,347	South Dakota	$747,324	Arizona	$4,413
49	Tennessee	$2,924	North Dakota	$27,709	Dist. of Columbia	$711,504	South Dakota	$4,375
50	Florida	$2,827	Mississippi	$27,662	Wyoming	$656,713	Mississippi	$4,039
51	Dist. of Columbia	—	South Dakota	$27,072	North Dakota	$642,984	Utah	$3,783

STATE PROFILES OF PUBLIC ELEMENTARY AND SECONDARY EDUCATION, 1996–97

Ranking of the States - Fiscal

Missouri Student/Teacher/ Staff Ratios

- **Missouri has 14th largest number of public school teachers nationally**
  - **Missouri ranks 14 in student/teacher ratio at 15.2**
  - **The national average is 17.1**
- **Missouri has the 15th largest number of administrators nationally**
- **Missouri ranks 35th in average teacher salary, which is equal to Kansas and Iowa**

(see Ranking of States graphs next page)

STAFFING

	Public school teachers		Student-teacher ratio		Number of administrators		Number of public schools	
	United States	2,667,419	United States	17.1	United States	204,282	United States	88,223
1	California	248,818	Utah	24.4	California	17,811	California	7,984
2	Texas	247,650	California	22.9	Texas	15,366	Texas	6,875
3	New York	185,104	Washington	20.2	New York	10,898	Illinois	4,185
4	Florida	120,471	Oregon	20.1	Illinois	10,295	New York	4,172
5	Illinois	116,274	Arizona	19.7	Florida	8,285	Ohio	3,876
6	Ohio	108,515	Michigan	19.1	Michigan	8,028	Michigan	3,853
7	Pennsylvania	106,432	Nevada	19.1	New Jersey	7,279	Pennsylvania	3,178
8	Michigan	88,051	Idaho	18.8	Virginia	7,000	Florida	2,801
9	New Jersey	87,642	Florida	18.6	Pennsylvania	6,947	Missouri	2,291
10	Georgia	81,795	Colorado	18.5	Ohio	6,667	New Jersey	2,279
11	North Carolina	75,239	Hawaii	17.7	Tennessee	6,488	Washington	2,180
12	Virginia	74,526	Minnesota	17.6	Georgia	6,331	Minnesota	2,116
13	Massachusetts	64,574	Alaska	17.5	North Carolina	6,116	Wisconsin	2,096
14	Missouri	59,428	Indiana	17.3	Indiana	5,064	North Carolina	2,005
15	Indiana	56,708	Mississippi	17.2	Missouri	4,510	Indiana	1,929
16	Tennessee	54,790	Arkansas	17.1	Massachusetts	4,315	Virginia	1,895
17	Wisconsin	54,769	Maryland	17.1	Wisconsin	4,270	Massachusetts	1,856
18	Washington	48,307	Ohio	17.0	Maryland	4,264	Oklahoma	1,828
19	Minnesota	48,245	Illinois	17.0	Washington	4,231	Georgia	1,798
20	Maryland	47,943	Pennsylvania	17.0	Louisiana	3,743	Tennessee	1,565
21	Louisiana	47,334	Louisiana	16.8	Colorado	3,722	Iowa	1,552
22	Alabama	45,035	Kentucky	16.7	Alabama	3,652	Colorado	1,531
23	South Carolina	41,463	New Mexico	16.7	Minnesota	3,593	Louisiana	1,477
24	Arizona	40,521	Delaware	16.6	Connecticut	3,337	Kansas	1,464
25	Oklahoma	39,568	Alabama	16.6	Iowa	2,968	Kentucky	1,407
26	Kentucky	39,331	Tennessee	16.5	South Carolina	2,949	Nebraska	1,396
27	Connecticut	36,551	Georgia	16.5	Mississippi	2,839	Alabama	1,345
28	Colorado	36,398	North Carolina	16.1	Oklahoma	2,794	Arizona	1,340
29	Iowa	32,593	Wisconsin	16.1	Oregon	2,703	Maryland	1,286
30	Kansas	30,875	Montana	16.0	Arizona	2,361	Oregon	1,222
31	Mississippi	29,293	South Carolina	15.7	Kansas	2,219	Arkansas	1,104
32	Oregon	26,757	Oklahoma	15.7	Arkansas	2,218	South Carolina	1,088
33	Arkansas	26,681	New Hampshire	15.6	Kentucky	1,903	Connecticut	1,027
34	West Virginia	20,888	Texas	15.5	New Mexico	1,863	Mississippi	1,007
35	Nebraska	20,174	Iowa	15.4	Nebraska	1,810	Montana	892
36	New Mexico	19,971	New York	15.4	West Virginia	1,702	West Virginia	869
37	Utah	19,734	North Dakota	15.2	Utah	1,546	South Dakota	832
38	Maine	15,551	Missouri	15.2	Maine	1,445	Utah	742
39	Nevada	14,805	Kansas	15.1	Hawaii	1,072	New Mexico	732
40	Idaho	13,078	South Dakota	14.9	Nevada	1,066	Maine	721
41	New Hampshire	12,692	District of Columbia	14.9	Idaho	1,007	Idaho	629
42	Rhode Island	10,656	Wyoming	14.7	New Hampshire	965	North Dakota	609
43	Hawaii	10,576	Virginia	14.7	North Dakota	913	New Hampshire	512
44	Montana	10,268	West Virginia	14.6	Alaska	878	Alaska	497
45	South Dakota	9,625	Nebraska	14.5	South Dakota	862	Nevada	442
46	North Dakota	7,892	Massachusetts	14.5	Montana	815	Wyoming	411
47	Vermont	7,751	Connecticut	14.4	District of Columbia	772	Vermont	395
48	Alaska	7,418	Rhode Island	14.2	Vermont	732	Rhode Island	316
49	Wyoming	6,729	New Jersey	14.0	Rhode Island	569	Hawaii	249
50	Delaware	6,642	Maine	13.7	Delaware	561	District of Columbia	184
51	District of Columbia	5,288	Vermont	13.7	Wyoming	538	Delaware	183

STATE PROFILES OF PUBLIC ELEMENTARY AND SECONDARY EDUCATION, 1996–97

Ranking of the States - Staffing

Access

- **The Collaborative view of the access issue – It is**
  - **The key problem in the state of Missouri**
  - **The key problem in other states**
  - **Their unswerving foundational view**
- **Look at measuring up, with more students**
  - **Graduating from high school**
  - **Going to college**
  - **Graduating from college**
- **Through-put—do whatever is necessary to put them through**
  - **Financial aid not based on merit**
  - **More community colleges**
  - **Bring the college to the student**
  - **More vocational/job training education**

Access

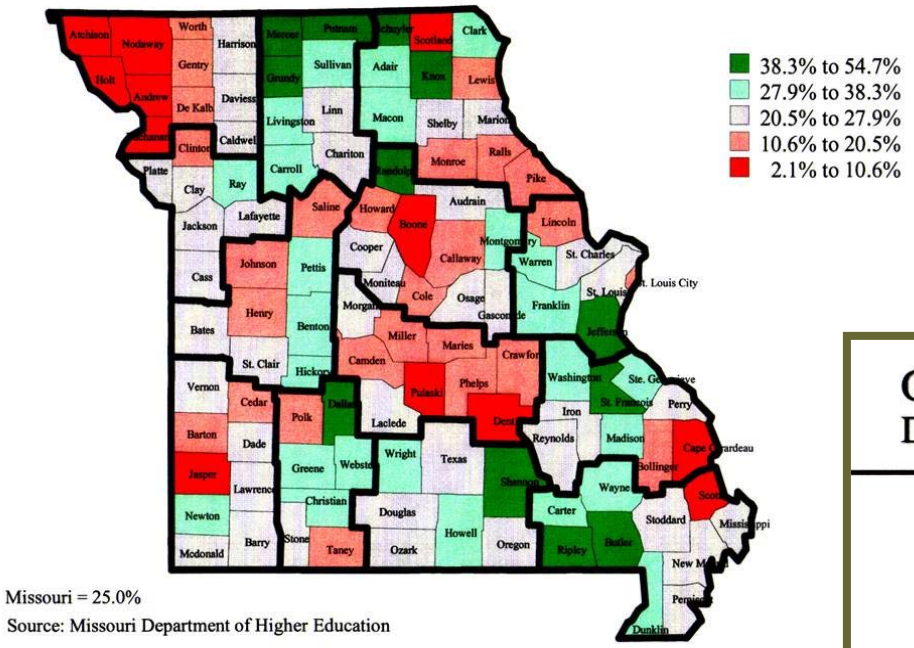
- **See Dennis Jones' graphs on college-going rates: Northwest Missouri and Southeast Missouri**
  - **The Northwest near Maryville has high 4-year rates**
  - **The Southeast also has high 4-year rates**
  - **Conversely, both of these areas have low 2-year rates**
  - **The low 2-year rate is proportionate to the high 4-year rate indicating we have a lot of students going to Southeast and Northwest Missouri State Universities who would otherwise go to community colleges**

  We *have* coverage and we *are* providing access, which may not be ideal but it is not failing either
- **St. Louis city is near the bottom of both the 4-year and 2-year scales**
  - **The Kansas City School District would appear similarly if broken out**
  - **The access problem is *primarily* an urban school problem**

Percent of HS Graduates Enrolling Directly Into College - 2002

College Going Rates – Percent of HS Graduates Enrolling Directly Into College (%) - 2002

Two-Year Institutions

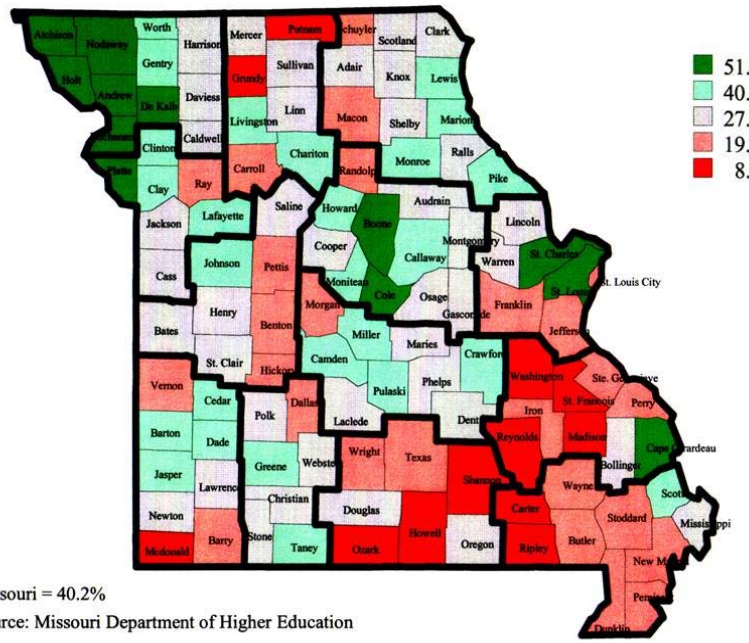


Missouri = 25.0%

Source: Missouri Department of Higher Education

College Going Rates – Percent of HS Graduates Enrolling Directly Into College (%) - 2002

Four-Year Institutions



Missouri = 40.2%

Source: Missouri Department of Higher Education

Access - An Urban Problem

- **Witness these really important indicators**
  - **0% of students at Central High School in Kansas City are at or above proficiency level**
  - **Persistence rates at Central dramatically decline through four years of school**
  - **Data from the No Child Left Behind initiative show teacher salaries at $38,000**
- **Significant factors to consider**
  - **Central is the largest public high school in Kansas City**
  - **Central students have no academic skills**
  - **Central has the lowest paid teachers, meaning younger, inexperienced, and without seniority**
  - **Class size is very small - below international averages**
- **Conclusion: The biggest access problem is the result of unbelievably under-performing high schools, with inexperienced teachers, teaching no core academic skills**

Affordability

- **The Collaborative gives Missouri a score of D+**
- **I agree that more money spent wisely would help**
- **Compare this to information from states such as Connecticut, Massachusetts, Colorado, New Jersey, and Maryland**
  - **They do well educationally, looking at the areas of adult higher education attainment, skill levels, graduation rates, economic benefits, and civic benefits**
  - **However, they fail all or some of the affordability scores**
- **Look again at Missouri**
  - **At the community college level, cost and affordability compares well nationally**
  - **Even as tuition has gone up at the 4-year colleges so has enrollment - indicating continued ability to pay in the system**
  - **The average student loan amount of circa $11,000 is not high by national standards and in the view of economists such as Gary Becker, and the 1999 Missouri Commission on Affordability, has not yet grown to a discouraging level of disincentive**

Missouri Skill Levels

- **Compared to the National average, Missouri is**
  - **Equal to the average in Math**
  - **Slightly above in Reading**
  - **Slightly above in Science**
  - **Slightly below in Writing**
- **Missouri average scores match Iowa and Kansas**
- **Missouri is significantly below Massachusetts**
- **We are below both Massachusetts and Iowa in the number of students at proficiency level - this is most likely to predict college persistence**

  (NCES chart - History of NAEP Participation and Performance)
- **MAP scores show the same pattern as NAEP with a decline in proficiency from 3rd to 7th to 11th grades - particularly severe in Math**

Missouri Skills - Continued

- **Missouri ACT scores**
  - **Are slightly higher than the national average and have tracked the nation in a real increase in the last decade**
  - **Those who take the 16-unit ACT core curriculum score three points better than those who don't - 22.8% vs. 19.7%**
  - **Note regarding geographic distribution of ACT scores on Dennis' map - Cape Girardeau, Adair, and Nodaway do well on the ACT, and St. Louis city and the rural southeast Missouri counties do not**
- **Even accounting for the self-selection bias of those taking the core curriculum, the lesson is obvious-**

  to increase academic success, we must focus on the core
- **Missouri compares well in the sciences**
  - **We are doing reasonably well in graduating Engineering and Computer Science BA's**
  - **We are at the top of our peer group in Computer Science**
  - **We are close to the top in graduating in the Life Sciences**

The Real Truth Behind It All

- **Our biggest problem in HS graduation rates, matriculation, college attendance, persistence, and graduation, comes from failure to prepare**
- **That failure to prepare is most notable in the large urban high schools in Kansas City and St. Louis**
- **Similar problems exist in certain rural counties - e.g., Sullivan county with its large Mexican immigrant population employed at Premium Standard's pork processing plant in Milan**
- **Drill down on the numbers from these places to the individual high schools like Central and Vashon and you will find massive numbers of students**
  - **Failing to reach basic levels of proficiency**
  - **Taught by our most inexperienced teachers**
  - **In high overhead, low achievement, racially unbalanced schools**
  - **With no core curriculum**

Teacher Education

- **The graphs are attached on performance of teachers in Missouri public institutions of higher learning - these numbers are *stunning***
  - **Look at the top three numbers and the bottom two - these, collectively, are the primary providers of teachers to the Kansas City and St. Louis school districts**
  - **Perhaps not even a majority of these future teachers are at the moderate skills level of the average high school student**
  - **The only school doing well is Truman State**
  - **UMC and SMSU do reasonably well**
  - **The other statistics here show**
    - **No progress in teacher skills** *(table 9)*
    - **Significant progress at Harris-Stowe, which is the only exclusive teacher preparation institution**
    - **Very low activity of grades in at least 5 of 13 schools including Harris-Stowe**
    - ***Only one-Truman-is performing well*** *(tables 7-8-9)*
- **Table 11 shows almost no institutions-again with the exception of Truman, doing well in the *major fields of study***

Teacher Education

- **Much national research has been done lately on the failure of education schools to teach content - that is, to teach the basic competence in the fields of study that teachers are expected to teach in middle school and high school**
  - **That is clearly true at Harris-Stowe, Lincoln, Missouri Southern, Missouri Western, and UMKC, and probably true at CMSU, SEMO, etc.**
  - **In our policy audit meetings, this program was identified as a significant one by teachers, faculty, and others**
  - **Leaders of UMC and Harris-Stowe were in various states of denial**
  - **This is one area that needs blowing up and reforming from the outside**

Teacher Education

Revolution—not reform

- **The single greatest failure in Missouri higher education, the most important reform, the nodal point in the connection between higher education and primary and secondary education, is our school of education establishment**
- **Let's blow it up**
- **In the policy audits, in conversation with faculty, students and business leaders, in listening to principals and teachers in our high and middle schools, there is universal desire for reform**

Teacher Education

- **Problems**
  - **Our teacher training programs take lower-performing students and do not add value**
  - **They are too concerned with theory, linguistics and abstractly considered pedagogy**
  - **Though attempts have and are being made to connect to high schools and middle schools, it is random and scattershot**
  - **Functionally, what we have today are some of our poorest performers being sent to our most academically poorly-performing schools in our most challenging areas**

Teacher Education

- **Proposed solutions**
  - **Teacher education should be content and standards-based to a significantly greater degree than today**
  - **We should judge and provide incentives for improving the standards at the schools of teacher training and connecting with the school districts in setting and raising standards**
  - **Teacher education should be assessed as we are assessing other levels of education, and results should be widely published and disseminated**

TABLE 7

FIRST-TIME, FULL-TIME DEGREE-SEEKING FRESHMEN WHO COMPLETED THE FIRST ACADEMIC YEAR WITH 24 CREDIT HOURS AND A GPA OF 2.0, FALL 1992 AND FALL 2001 FRESHMEN

	FALL 1992	FALL 2001	ADMISSIONS SELECTIVITY
PUBLIC BACCALAUREATE AND HIGHER DEGREE-GRANTING INSTITUTIONS			
CENTRAL	56%	74%	MODERATELY SELECTIVE
HARRIS-STOWE	18%	40%	MODERATELY SELECTIVE
LINCOLN	43%	34%	OPEN ENROLLMENT
MISSOURI SOUTHERN	62%	62%	MODERATELY SELECTIVE
MISSOURI WESTERN	41%	51%	OPEN ENROLLMENT
NORTHWEST	62%	75%	MODERATELY SELECTIVE
SOUTHEAST	48%	68%	MODERATELY SELECTIVE
SOUTHWEST	59%	75%	SELECTIVE
TRUMAN	84%	89%	HIGHLY SELECTIVE
UMC	78%	81%	SELECTIVE
UMKC	70%	73%	SELECTIVE
UMR	78%	81%	SELECTIVE
UMSL	53%	63%	SELECTIVE
PUBLIC CERTIFICATE AND ASSOCIATE DEGREE-GRANTING INSTITUTIONS	37%	40%	OPEN ENROLLMENT

SOURCE: Enhanced Missouri Student Achievement Study

Freshmen Completing 24 Credit Hours With a GPA of at Least 2.0

Freshmen Meeting Admissions Guidelines at Public Colleges and Universities

TABLE 8

PERCENT OF FIRST-TIME, FULL-TIME DEGREE-SEEKING FRESHMEN MEETING ADMISSIONS GUIDELINES AT MISSOURI PUBLIC BACCALAUREATE AND HIGHER DEGREE-GRANTING INSTITUTIONS, FALL 1992 AND FALL 2002

	FALL 1992	FALL 2002	ADMISSIONS SELECTIVITY
CENTRAL	58%	72%	MODERATELY SELECTIVE
HARRIS-STOWE	25%	73%	MODERATELY SELECTIVE
MISSOURI SOUTHERN	69%	68%	MODERATELY SELECTIVE
NORTHWEST	66%	77%	MODERATELY SELECTIVE
SOUTHEAST	76%	74%	MODERATELY SELECTIVE
SOUTHWEST	53%	64%	SELECTIVE
TRUMAN	83%	92%	HIGHLY SELECTIVE
UMC	82%	87%	SELECTIVE
UMKC	80%	67%	SELECTIVE
UMR	93%	91%	SELECTIVE
UMSL	65%	71%	SELECTIVE

Note: Percents do not include the 10% exemption rate.

Lincoln and Missouri Western are open enrollment institutions.

SOURCE: Enhanced Missouri Student Achievement Study

Teacher Education Statistics at Public Colleges and Universities

TABLE 9

TEACHER EDUCATION, PUBLIC BACCALAUREATE AND HIGHER DEGREE-GRANTING INSTITUTIONS, 2001-2002

	Percent of Students Admitted to Teacher Education Programs Meeting the CBHE Admission Recommendations of an ACT Composite at the 66th Percentile and/or a Score of 265 or Above on the C BASE	Percent of Teacher Education Graduates Meeting the CBHE Recommended NTE Exit Goal (Scoring at or Above the 50th Percentile)	Admissions Selectivity
CENTRAL	60%	52%	MODERATELY SELECTIVE
HARRIS-STOWE	33%	23%	MODERATELY SELECTIVE
LINCOLN	37%	33%	OPEN ENROLLMENT
MISSOURI SOUTHERN	70%	56%	MODERATELY SELECTIVE
MISSOURI WESTERN	82%	65%	OPEN ENROLLMENT
NORTHWEST	84%	48%	MODERATELY SELECTIVE
SOUTHEAST	84%	56%	MODERATELY SELECTIVE
SOUTHWEST	92%	60%	SELECTIVE
TRUMAN	97%	98%	HIGHLY SELECTIVE
UMC	96%	77%	SELECTIVE
UMKC	63%	59%	SELECTIVE
UMSL	58%	45%	SELECTIVE
TOTAL	78%	56%	

	Trends in the Percent of Students Admitted to Teacher Education Programs Meeting the CBHE Admission Recommendations of an ACT Composite at the 66th Percentile and/or a Score of 265 or Above on the C-BASE	Trends in the Percent of Teacher Education Graduates Meeting the CBHE Recommended NTE Exit Goal (Scoring at or Above the 50th Percentile)
1992-93	74%	57%
1993-94	77%	59%
1994-95	76%	59%
1995-96	68%	52%
1996-97	65%	55%
1997-98	68%	56%
1998-99	67%	59%
1999-00	68%	59%
1999-00	70%	60%
2000-01	75%	60%
2001-02	78%	56%

SOURCE: Performance Indicators Survey

TABLE 10

ASSESSMENT IN GENERAL EDUCATION AT PUBLIC BACCALAUREATE AND HIGHER DEGREE-GRANTING INSTITUTIONS, FY 2002

Performance on Assessments of General Education, FY 2002

	Percent Who Took a Nationally Normed Test	Of Those Who Took a Nationally Normed Test, the Percent Scoring at or Above the 50th Percentile	Admissions Selectivity
CENTRAL	35%	66%	MODERATELY SELECTIVE
HARRIS-STOWE	N/A	N/A	MODERATELY SELECTIVE
LINCOLN	68%	36%	OPEN ENROLLMENT
MISSOURI SOUTHERN	97%	52%	MODERATELY SELECTIVE
MISSOURI WESTERN	99%	47%	OPEN ENROLLMENT
NORTHWEST	82%	55%	MODERATELY SELECTIVE
SOUTHEAST	60%	50%	MODERATELY SELECTIVE
SOUTHWEST	100%	57%	SELECTIVE
TRUMAN	100%	75%	HIGHLY SELECTIVE
UMC	62%	81%	SELECTIVE
UMKC	76%	53%	SELECTIVE
UMR	70%	83%	SELECTIVE
UMSL	78%	45%	SELECTIVE

Percent of Baccalaureate Degree Recipients Performing at the 50th Percentile or Above on Nationally Normed Assessments of General Education, FY 1993, FY 1995-FY 2002

	Percent Assessed	Scored at or Above the 50th Percentile
FY 1993	49.5%	67.4%
FY 1995	72.4%	60.8%
FY 1996	62.8%	60.9%
FY 1997	62.1%	58.9%
FY 1998	62.4%	59.2%
FY 1999	69.8%	61.6%
FY 2000	74.9%	63.2%
FY 2001	75.3%	62.4%
FY 2002	74.3%	61.0%

SOURCE: Performance Indicators Survey

Assessment in General Education - Public Colleges and Universities

TABLE 11

ASSESSMENT IN THE MAJOR FIELD OF STUDY AT PUBLIC BACCALAUREATE AND HIGHER DEGREE-GRANTING INSTITUTIONS

Performance of Baccalaureate Degree Recipients on a Nationally Normed Major Field of Study Test, FY 2002

	Percent Assessed	Of Those Assessed, the Percent Who Scored at or Above the 50th Percentile	Admissions Selectivity
CENTRAL	42%	63%	MODERATELY SELECTIVE
HARRIS-STOWE	40%	17%	MODERATELY SELECTIVE
LINCOLN	47%	38%	OPEN ENROLLMENT
MISSOURI SOUTHERN	56%	49%	MODERATELY SELECTIVE
MISSOURI WESTERN	47%	45%	OPEN ENROLLMENT
NORTHWEST	49%	61%	MODERATELY SELECTIVE
SOUTHEAST	25%	53%	MODERATELY SELECTIVE
SOUTHWEST	50%	52%	SELECTIVE
TRUMAN	96%	77%	HIGHLY SELECTIVE
UMC	28%	61%	SELECTIVE
UMKC	64%	49%	SELECTIVE
UMR	21%	65%	SELECTIVE
UMSL	52%	52%	SELECTIVE

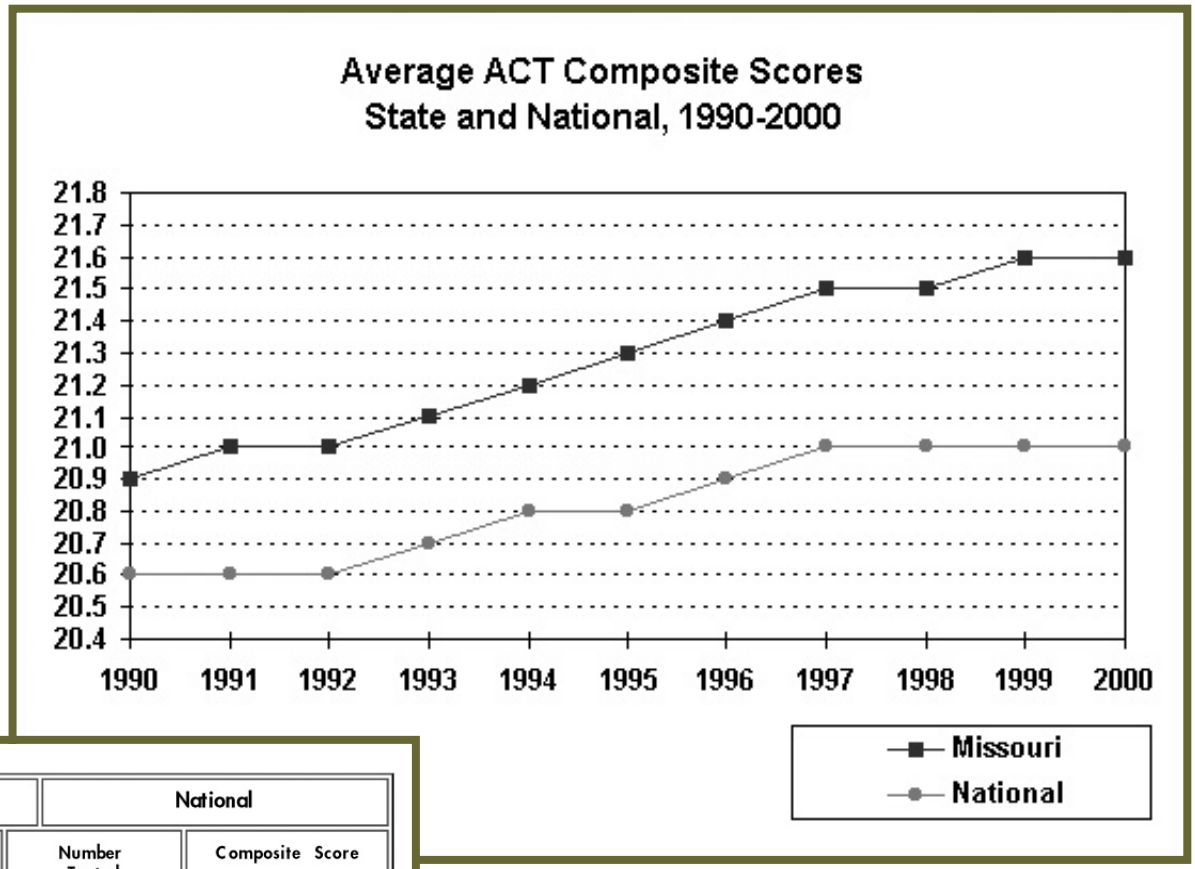
Percent of Baccalaureate Degree Recipients Performing at the 50th Percentile or Above on a Nationally Normed Major Field of Study Test, FY 1997-FY 2002

	Percent Assessed	Of Those Assessed, the Percent Who Scored at or Above the 50th Percentile
FY 1997	60.3%	53.7%
FY 1998	57.0%	58.1%
FY 1999	59.4%	56.3%
FY 2000	59.9%	58.1%
FY 2001	59.3%	58.6%
FY 2002	45.3%	57.2%

SOURCE: Performance Indicators Survey

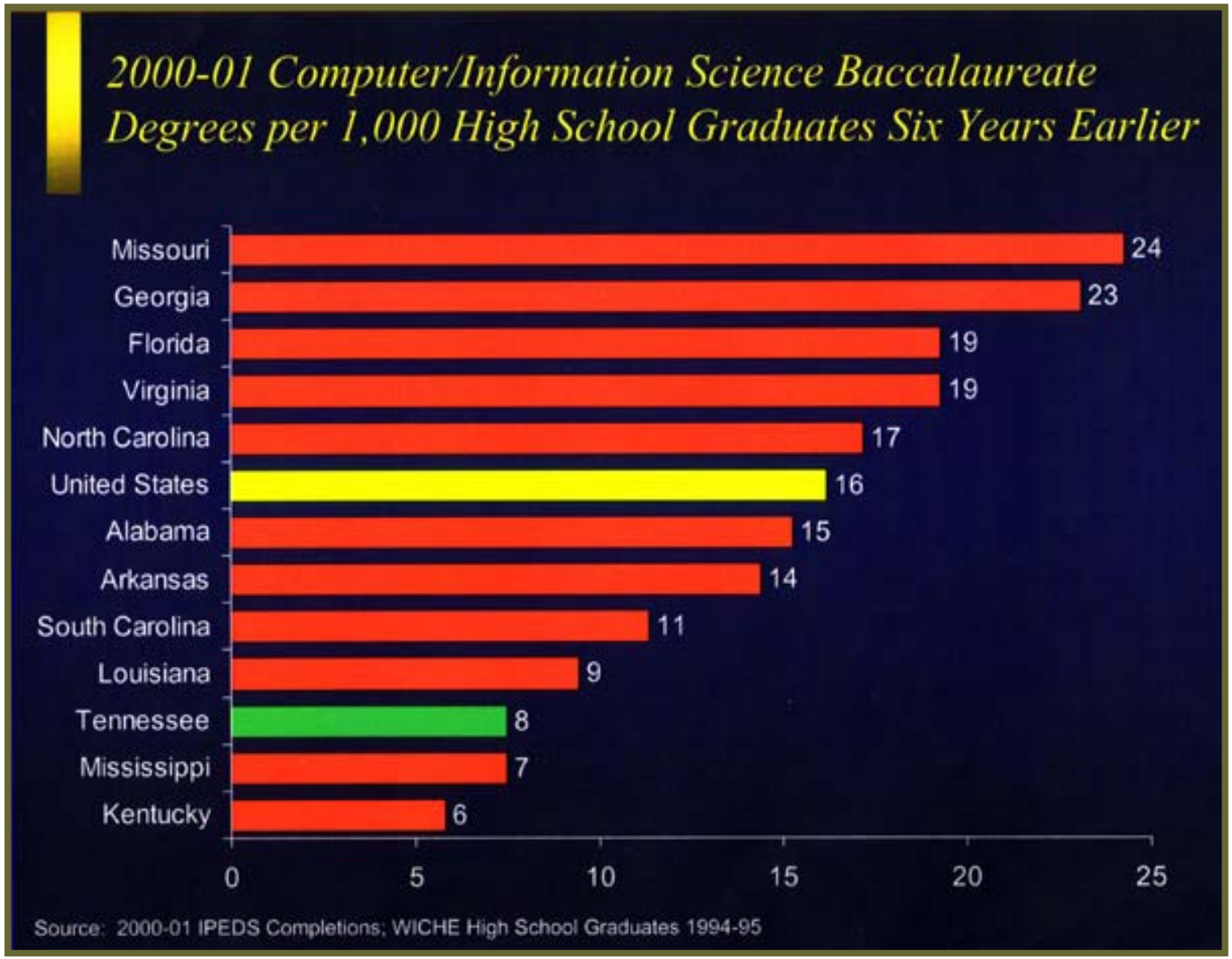
Assessment in Major Field of Study - Public Colleges and Universities

ACT Composite Scores for Missouri and U.S. 1990-2000

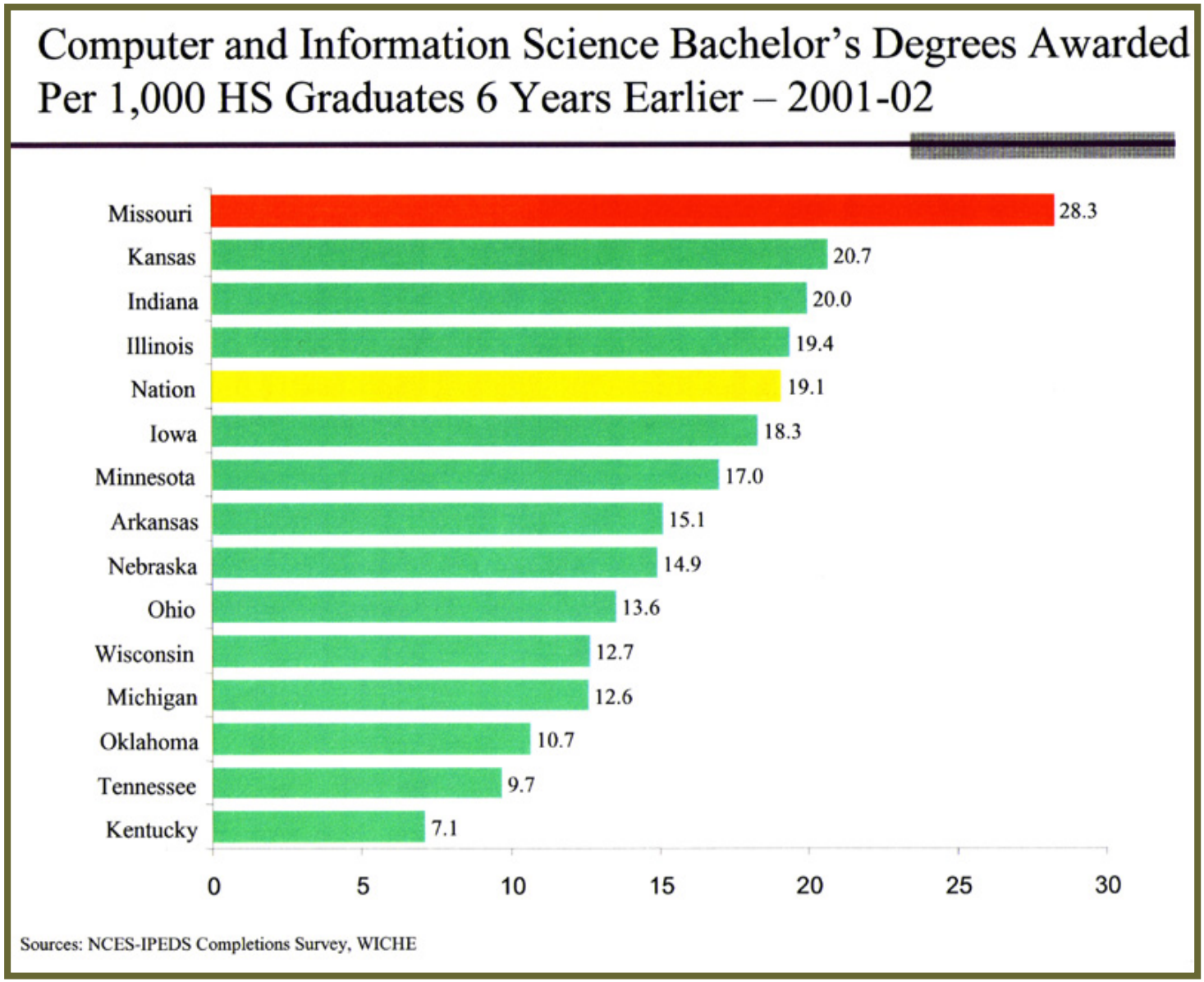


	Missouri		National	
	Number Tested	Composite Score	Number Tested	Composite Score
1990	34,131	20.9	817,096	20.6
1991	33,154	21.0	796,983	20.6
1992	33,830	21.0	832,217	20.6
1993	34,493	21.1	875,603	20.7
1994	33,935	21.2	891,714	20.8
1995	36,054	21.3	945,369	20.8
1996	35,601	21.4	924,663	20.9
1997	37,573	21.5	959,301	21.0
1998	38,633	21.5	995,039	21.0
1999	39,663	21.6	1,019,053	21.0
2000	40,997	21.6	1,065,138	21.0

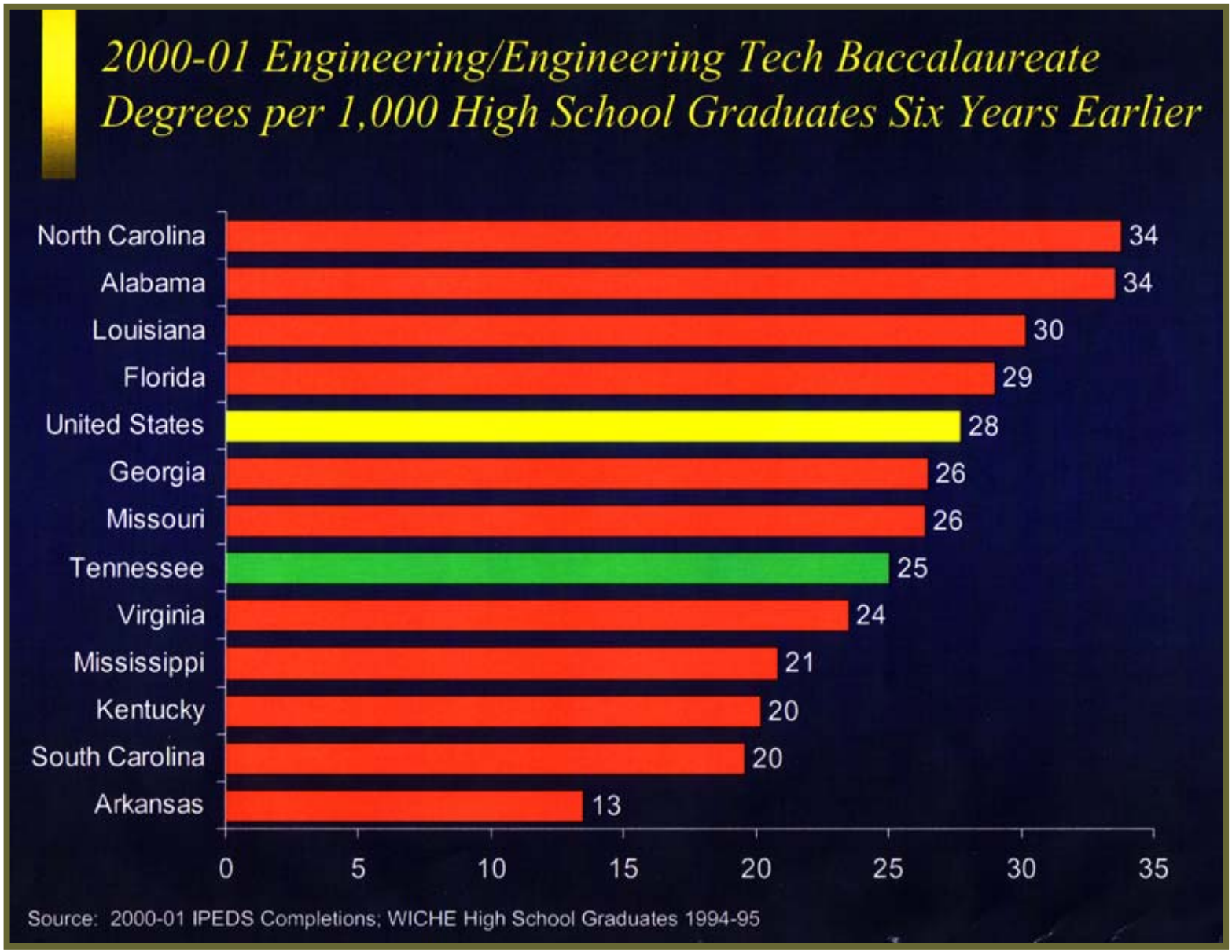
State Comparison of Computer and Information Science Degrees 2000-2001



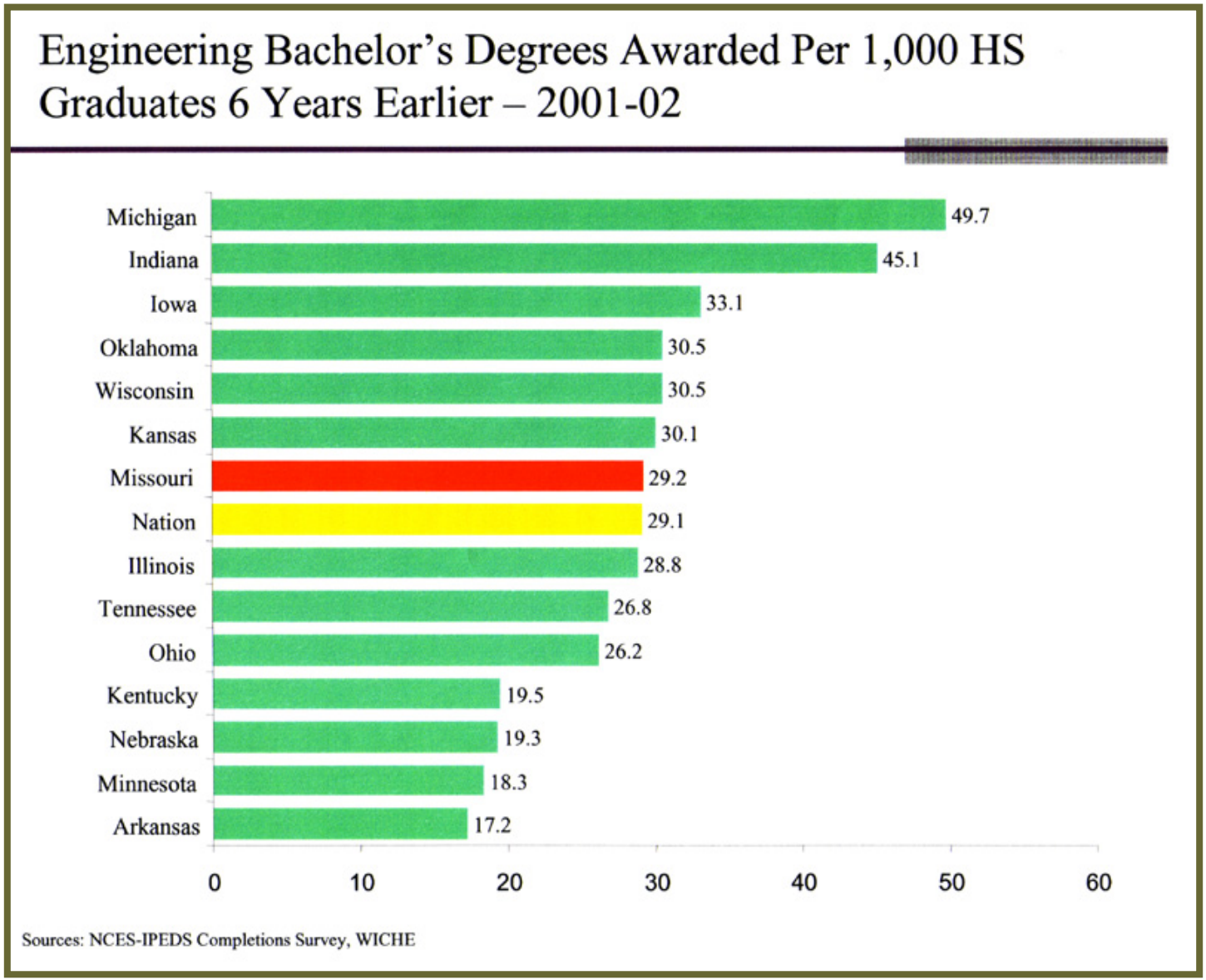
State Comparison of Computer and Information Science Degrees 2001-2002



State Comparison of Engineering Degrees 2000-2001



State Comparison of Engineering Degrees 2001-2002



Missouri MAP Scores 1999-2003

Missouri MAP Scores

COMMUNICATION ARTS

	3rd Grade					7th Grade					11th Grade				
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003
Advanced	1.2%	1.6%	1.0%	1.8%	1.40%	2.40%	3.10%	2.00%	2.00%	1.90%	1.20%	1.00%	0.30%	0.70%	0.40%
Proficient	27.6%	30.1%	30.6%	33.6%	32.70%	28.00%	29.20%	32.20%	30.00%	30.60%	22.10%	21.80%	22.30%	23.00%	21.40%
Nearing Proficient	39.2%	38.2%	39.8%	38.4%	39.50%	30.50%	29.90%	31.20%	32.50%	31.30%	37.90%	38.40%	43.60%	41.70%	42.80%
Progressing	22.4%	21.3%	21.1%	20.0%	19.30%	22.10%	21.90%	20.80%	22.20%	21.90%	18.50%	19.60%	18.70%	17.50%	18.20%
Step 1	9.6%	8.8%	7.5%	6.3%	7.10%	16.90%	15.90%	13.70%	13.30%	14.40%	20.20%	19.20%	15.10%	17.10%	17.20%
Median NP*	58	59	61	62	62	58	59	59	59	62	62	61	63	63	62
LND**	2.20%	2.20%	1.60%	1.30%	1.60%	3.70%	3.00%	2.50%	1.80%	2.50%	8.50%	5.90%	4.10%	3.70%	3.60%
Reportable Students	69,103	69,686	70,544	68,013	64,898	67,556	66,713	67,971	69,552	70,546	50,583	53,396	54,568	56,994	57,881

MATHEMATICS

	4th Grade					8th Grade					10th Grade				
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003
Advanced	6.40%	8.00%	8.20%	7.70%	6.60%	0.60%	1.20%	1.40%	1.20%	1.10%	0.50%	0.40%	1.00%	0.80%	0.80%
Proficient	28.90%	28.70%	29.40%	29.90%	30.60%	9.70%	12.80%	13.40%	12.50%	12.80%	9.20%	9.90%	11.80%	9.90%	11.50%
Nearing Proficient	42.60%	41.00%	41.90%	41.30%	42.60%	29.10%	28.80%	30.90%	31.70%	34.90%	28.40%	29.60%	30.50%	30.30%	32.20%
Progressing	18.90%	19.30%	17.80%	18.40%	17.60%	38.10%	34.10%	33.50%	34.40%	33.70%	34.40%	33.70%	33.90%	34.20%	32.70%
Step 1	3.20%	3.00%	2.60%	2.70%	2.70%	22.40%	23.00%	20.90%	20.20%	17.50%	27.50%	26.30%	22.90%	24.90%	22.70%
Median NP*	59	61	62	62	62	59	59	60	60	65	68	70	70	70	74
LND**	1.70%	1.60%	1.10%	0.90%	1.20%	3.60%	2.90%	1.90%	1.60%	1.90%	6.10%	4.60%	3.00%	2.60%	2.70%
Reportable Students	68,404	69,554	70,753	71,242	68,621	67,220	67,527	67,167	67,871	69,317	59,440	59,979	62,891	63,755	63,956

SCIENCE

	3rd Grade					7th Grade					10th Grade				
	1999	2000	2001	2002	2003*	1999	2000	2001	2002	2003*	1999	2000	2001	2002	2003*
Advanced	3.70%	9.90%	10.50%	9.00%	9.70%	1.90%	2.50%	2.00%	2.00%	2.30%	0.50%	1.10%	2.40%	0.70%	1.20%
Proficient	31.00%	35.00%	35.20%	38.70%	38.10%	12.60%	12.80%	11.60%	12.20%	12.70%	4.00%	4.70%	6.30%	4.50%	5.10%
Nearing Proficient	43.80%	36.60%	36.70%	36.80%	37.80%	25.60%	25.40%	25.70%	26.50%	25.30%	42.50%	38.00%	40.20%	39.00%	38.60%
Progressing	16.00%	13.40%	13.00%	11.70%	11.50%	38.90%	39.50%	41.40%	41.40%	39.10%	37.20%	37.70%	35.70%	36.50%	36.60%
Step 1	5.50%	5.20%	4.70%	3.80%	2.90%	21.00%	19.90%	19.30%	17.80%	20.60%	15.80%	18.50%	15.40%	19.40%	18.50%
Median NP*	67	70	70	73	64	59	59	60	60	56	64	66	66	65	64
LND**	2.00%	1.80%	1.30%	1.20%	1.50%	3.60%	2.60%	2.10%	1.70%	2.00%	6.50%	4.80%	3.20%	3.10%	2.60%
Reportable Students	69,194	69,928	70,708	68,015	58,089	67,555	67,121	68,205	69,687	63,904	59,024	59,958	62,770	63,458	57,432

SOCIAL STUDIES

	4th Grade					8th Grade					11th Grade				
	1999*	2000	2001	2002	2003*	1999*	2000	2001	2002	2003*	1999*	2000	2001	2002	2003*
Advanced	5.40%	14.20%	14.80%	13.90%	18.60%	8.70%	14.00%	12.30%	11.70%	12.80%	4.00%	6.30%	7.40%	5.70%	7.50%
Proficient	20.60%	23.50%	27.00%	26.20%	23.80%	27.70%	28.30%	29.50%	30.30%	27.60%	10.00%	10.40%	13.00%	10.20%	10.60%
Nearing Proficient	36.40%	30.10%	31.40%	31.10%	28.00%	28.90%	26.30%	28.30%	28.20%	27.60%	40.30%	38.60%	39.60%	40.70%	35.90%
Progressing	27.20%	23.00%	20.00%	20.50%	21.10%	15.90%	13.60%	14.10%	13.50%	14.20%	20.40%	20.20%	19.40%	20.40%	19.30%
Step 1	10.40%	9.20%	6.80%	8.30%	8.50%	18.80%	17.70%	15.80%	16.40%	17.80%	25.30%	24.50%	20.50%	23.00%	26.80%
Median NP*	62	66	67	67	71	62	64	64	64	59	59	61	61	61	60
LND**	1.90%	1.70%	1.20%	1.10%	1.30%	3.70%	3.00%	1.90%	1.80%	2.00%	6.90%	4.60%	3.00%	2.70%	2.80%
Reportable Students	52,902	69,441	70,715	71,123	59,117	51,732	67,364	67,187	67,772	59,812	38,475	54,105	55,125	57,417	49,967

LND** (Level Not Determined) = The number of students who were Accountable but did not receive a MAP Score. A student will be considered LND if the student was exempt, caught cheating, or did not have a valid attempt on the test.
Median NP* = Median TerraNova National Percentile
*Voluntary Year of Administration

8/18/2003

From NCES' Nation's Report Card

History of NAEP Participation and Performance

Subject	Grade	Year	Scale Score: State Avg.	Scale Score: [Nat. Avg.]*	Achievement Level: Percent at or Above Basic	Proficient	Advanced	Graphics
Mathematics (scale: 0-500)	4	1992[n]	222	[219]	62	19	1	• Scale Scores • Achievement Levels • Cross-state Comparison Maps: ○ Scale Scores ○ Percent at or Above Proficient
		1996[n]	225	[222]	66	20	1	
		2000[n]	229	[226]	72	23	2	
	8	1992[n]	271	[267]	62	20	2	
		1996[n]	273	[271]	64	22	2	
		2000[n]	274	[274]	67	22	2	
Reading (scale: 0-500)	4	1992[n]	220	[215]	67	30	6	• Scale Scores • Achievement Levels • Cross-state Comparison Maps: ○ Scale Scores ○ Percent at or Above Proficient
		1994[n]	217	[212]	62	31	7	
		1998	216	[213]	61	28	5	
		2002	220	[217]	66	32	7	
	8	1998	262	[261]	75	28	1	
		2002	268	[263]	82	33	2	
Science (scale: 0-300)	4	2000[n]	156	[148]	75	35	4	• Scale Scores • Achievement Levels • Cross-state Comparison Maps: ○ Scale Scores ○ Percent at or Above Proficient
	8	1996[n]	151	[148]	64	28	2	
		2000[n]	156	[149]	68	36	4	
Writing (scale: 0-300)	4	2002	151	[153]	86	22	1	• Scale Scores • Achievement Levels • Cross-state Comparison Maps: ○ Scale Scores ○ Percent at or Above Proficient
	8	1998	142	[148]	80	17	0	
		2002	151	[152]	86	27	1	

* Includes public schools only

[n] Accommodations were not permitted for this assessment

Missouri ACT Scores by County

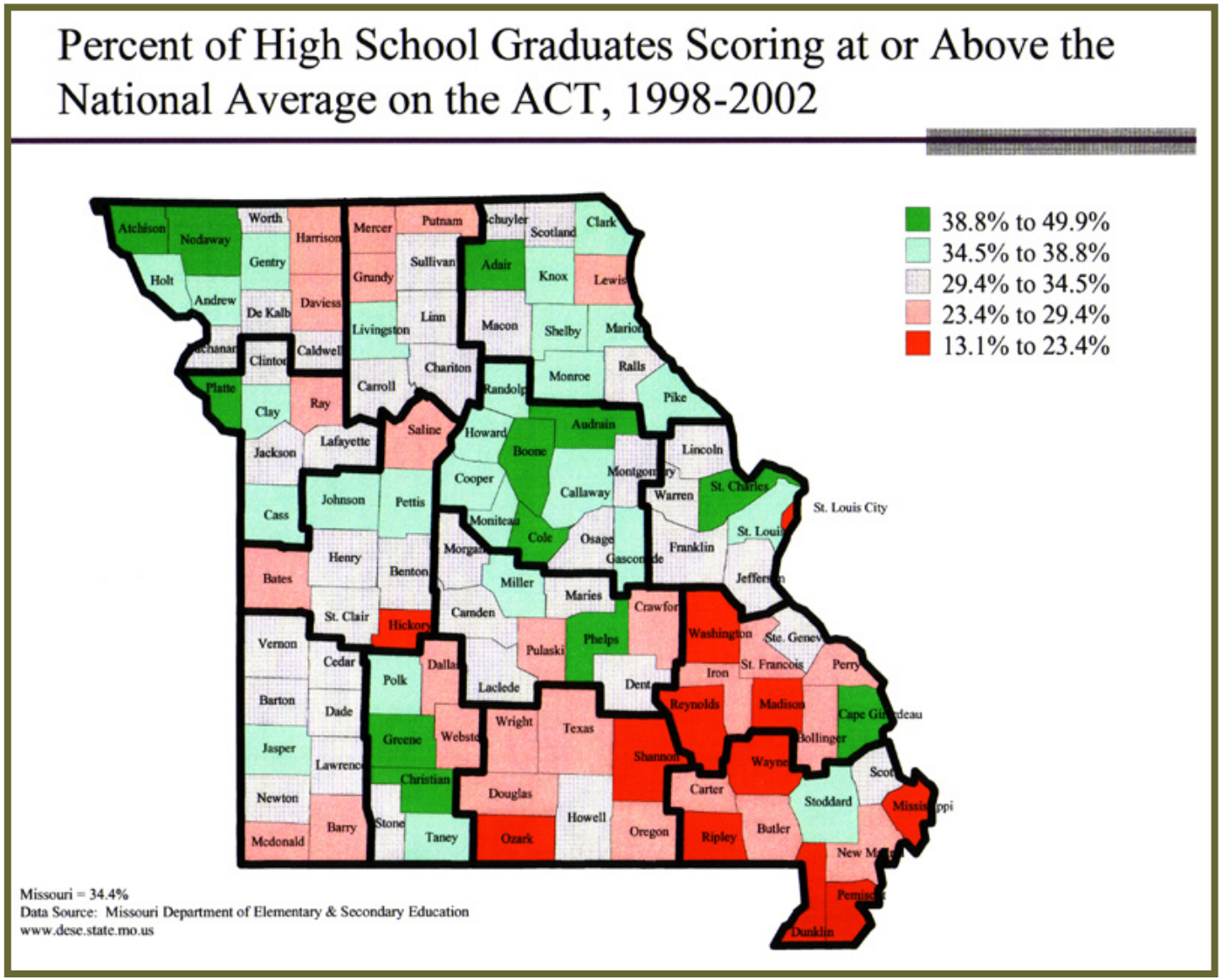


Table 1: Number of Earned Degrees in Science and Engineering by Hispanics, 1991-2000

	1991	2000	Percent Change
Bachelor's Degree			
Engineering	2,566	4,068	+59%
Physical Science	533	1,010	+89%
Mathematical Science	480	640	+33%
Computer Science	1,215	2,035	+67%
Master's Degree			
Engineering	468	852	+82%
Physical Science	96	126	+31%
Mathematical Science	85	97	+14%
Computer Science	128	262	+105%
Doctorate Degree			
Engineering	61	80	+31%
Physical Science	81	95	+17%
Mathematical Science	9	14	+56%
Computer Science	12	13	+8%

Source: Susan T. Hill, *Science and Engineering Degrees by Race/Ethnicity of Recipients: 1991-2000*, National Science Foundation, NSF 02-329, Tables 4, 5, 6.

Number of Degrees Earned in Science and Engineering by Hispanics 1991-2000

Higher Education Reform Recommendations

- **Connect the curriculum at all levels to a rigorous notion of core liberal arts learning in Math, Science, English, and History**
  - **Higher level Math and Science should be available to all**
  - **It should be related to the curriculum available in 2-year colleges and that in turn should be related to what is required in 4-year colleges and universities**
  - **A body outside of DESE and DHE, outside of the institutions themselves, should set these standards**
  - **93% of our college goers take the ACT core curriculum, but only 69%of graduates took the test and only 58% of them completed the core curriculum**
  - **Only about 40% overall are taking and completing the core curriculum - this number is the basic challenge** ***(source - Kansas City Star)***

Higher Education Reform Recommendations

- **Create a Teacher Achievement Bonus - TAB**
  - **Missouri should create a program to forgive up to $1,500 per year to a maximum of five years/$7,500 of the student loans of any student who achieves significant competency in our Teacher Training Institutes and goes to teach in an underperforming school district**
- **Teacher Institutes**
  - **Blow up the failed-to-mediocre teacher training and education in existence today**
  - **Establish four Training Institutes - East, West, North, South**
  - **Have them report directly to the Secretary of Education**
  - **Each should work with the largest under-performing high schools in their areas**
  - **The teachers would major in core curriculum subjects and in turn would intern as teachers of those subjects in high schools and middle schools**

Higher Education Reform Recommendations

- **The universities and colleges would commit to educating in core curriculum subjects, connecting to local schools and maintaining the quality through the Missouri careers of their students**
- **This quality ranking of students, core offerings, and teacher careers would be part of each school's 10K (both the teacher training and the local school)**
- **The Teacher Institutes would be run by the most successful private or public universities**

  (Today, for instance, Truman State would be in charge)

Learning and Earning - Part Two

- **What *kind* of skills and learning are needed?**
  - **Science and math and communication skills underpin success in the contemporary world**
  - ***A Nation At Risk* identified our problems 20 years ago and a great many fits and starts at reform have been made in the intervening time**
  - **Resources have grown - in Missouri alone we have increased the school foundation formulas by $800 million in ten years**
  - **In response to the failure of money and resources generally (class size and technology) to make much difference and the work of Coleman, Hanushek and others demonstrating no or little correlation between resources and outcomes - the effect of class size in the very early years is still an open question**

Learning and Earning - Part Two

- **The focus has changed to standard- based reform and assessment and high-stakes testing (no pass, no promotion)**
- **Much of the research and debate has focused on the black-white achievement gap and the argument of The Bell Curve that significant proportions of academic differences are innate - in the process of refuting this claim by Herrnstein and Murray, useful work has been done on what *does* make a difference**
- **Six sources cited (but these could be multiplied)**
  - **The Black-White Test Score Gap, edited by Christopher Jencks and Meredith Phillips**
  - **Earning and Learning: How Schools Matter, edited by Susan Mayer and Paul E. Peterson**
  - **"Learning to Earn" by Thomas Dee**
  - **Will Standards Save Public Education, Deborah Meier**
  - **No Excuses: Closing The Racial Gap In Learning by Abigail and Stephen Thernstrom**
  - **Our Schools And Our Future, edited by Paul E. Peterson**

Learning and Earning - Part Two

- **The conclusions are not without qualification or controversy but in essence they argue**
  - **Higher Course Requirements - teaching rigorous and advanced content, particularly in *Math***
  - **Learning Assessments - established for graduation, matriculation, degree, and advancement or other incentives**
  - **Teaching and Training Teachers and Students in Content**
  - **Assessing, Testing, Assessing - the jury is still out on high stakes testing (Massachusetts has a massive experiment going on) but assessing at all levels has increasing support.**
  - **Mastery of traditional disciplines**
- **Results in**
  - **Greater academic achievement and advancement on the ladder of learning**
  - ***Greater lifetime earnings***
  - **Higher employability**
- **These results are greater for blacks, Hispanics, at risk students, lower-income students**

Learning and Earning Part Two

- **In Missouri our A+ and core curriculum schools**
  - **Approximately one-third of the total tend to be in higher achieving and higher socio-economic districts**
  - **This is the *reverse* of what we need to do.**
- **We need curriculum standards and higher expectations in the Central, Vashon, and Milan (Sullivan County) schools**
  (see Adair and Sullivan p.121)
- **We need our best teachers there**
- **We need our colleges and universities to lift—through aspiration *and* through teacher training— the possibilities for the most underserved**
- **But we must lift their aspirations first**

Learning and Earning - Part Two

- **As Jay Girotto and Paul Peterson say in their article "Hard Courses and Good Grades"**

  "These findings are intuitively satisfying. If students take harder courses and put more effort into their studies, they learn more. And what they learn can make a difference later on. Indeed our non-academic friends regard these findings as banal. And so they would be, were it not for the fact that both academic scholarship and educational policy seem at odds with common sense….

  But such errors have provided the foundation for the incarceration theory of education, which seems to say it is only the quantity, not the quality of the educational experience that counts." (Learning and Earning p.224)

- **The shopping mall high school has led to the Chinese menu university—it doesn't matter what you take or how much of it you take: you will be left hungry for the real food of learning**

Hispanics in Science and Engineering

- **The best example of these forces at work can be seen in the dramatic increase in Hispanic science and engineering degrees over the last decade**

  (ETS, Hispanics in Science and Engineering - Graph Table 1)
- **Both the absolute numbers and the percentages have jumped dramatically**
- **This has happened while Hispanics generally, and Hispanic males in particular, have slower graduation and achievement rates in secondary and post secondary schools**

How has this happened?

- **NAEP shows the hurdle: 20% of white 12th graders reach proficiency in math and only 4% of Hispanics.**
- **"The highest predictor of persistence to college graduation was taking a rigorous curriculum in high school."**

  (Answers in the Tool Box, Clifford Adelman, USDE)

Hispanics in Science and Engineering

- **Financial Aid is important**
- **Guidance is important**
- **Aspiration and Persistence are most important**

  "But it is not just a problem of getting achievement up to some *minimum* (the way we approached it in the 1970's). It is also getting a higher proportion up to a *maximum."*

- **Aspiration to, and expectation of, achievement is found to be similar in all racial and socio-economic groups. One of the great *American* traits is the belief that *It Can Be Done And I Can Do It***

  If *counseled* to achieve, if *expected* to achieve, if *encouraged* to achieve, if given the *opportunity* to achieve, a surprising number of students *will* achieve

  (see Jaime Escalante p. 119)

Hispanics in Science and Engineering

- **The minority achievers were found to persist unusually: few dropped out**
- **They found math and science enjoyable and they expressed "personal commitment" to math and science**
- **"College based recruitment/enrollment made a difference."**
- **Summer opportunities, knowing minority role models, internships, exposure to math and science classes all a part of it**
- **But the single most important factor "the intensity of the high school curriculum…the rigors of the high school courses taken is a better predictor of completion of degree than either test scores or GPA/class rank."**

  (*Answers in the Tool Box, Clifford Adelman USDE)*
- **"The integrity and quality of curriculum is an investment of years of effort - in schools, teachers and students and provides momentum into higher education and beyond. It obviously pays off."**

  (Clifford Adelman)

A pretty good definition of human capital

Adair and Sullivan: Top and bottom

- Adair scores in the top two categories in all of Dennis Jones' measurements
- Sullivan, the county next door, scores in the bottom of almost all categories
- There are no obvious socio-economic reasons for this - nor any obvious expenditures or access or affordability reasons for this, except for two exceptions to this which are institutionally and locally specific
  - Sullivan is home to one of the largest pork processing plants in the state, with attendant population of immigrant workers, and an increasing number of Hispanic children, and its largest town boasts no educational institutions beyond high school
  - Adair County, on the other hand, has Truman State in Kirksville as the apex of educational achievement and an academic pillar of the county community
- The Collaborative's view, dominated as it is by the question of access, would look for a way to send Adair High kids to Kirksville or add a Truman or a community college outpost in Milan - But as an experiment, what if we went the other way?
  - What if we provided incentives for the very high performance students at Truman to join forces with the School districts in Adair?
  - What if we forgave loans to Truman students over 3-5 year teaching career in Sullivan County?

Most Important Single Factor
(that we can do something about)

- **A growing body of research, is that of the primary determinants:**
  - **Family background**
  - **Innate Aptitude (IQ or K)**
  - **Other environmental/cultural factors (TV, nutrition, reading)**
  - **Socio economic status**
  - **School resources**
  - **Class size**
  - **Curriculum**
- **The one that public policy can effect the most good with for disadvantaged sectors of the population, blacks, Hispanics and low-income students is**

Curriculum

Curriculum

- **A high quality, rigorous, and advanced curriculum, *particularly in math,* open to as many students as possible untracking the system, encouraging *higher expectations* and *aspirations*.**
- **"…if you start testing achievement you send a measure to people that this is what you 've got to learn to go to a good college, or to any college, whatever. And we know from all kinds of evidence that if you actually set a task like that the minority students can do better than they're now doing."**

Cf. Christopher Jencks, Black White Test Score Gap Introduction 1997 and PBS Frontline Interview 1999

The Jaime Escalante Effect

- **Escalante took an east Los Angles barrio school class of historically low performance and turned it into the *highest performing* AP calculus class in the nation**
- **In the first year the ETS didn't believe the results and made the class take the exam over with monitors they performed better the second time**
- **Over a decade they performed at or better than the national leaders at New Trier in Chicago or the Bronx High School of Science in New York**

- **What is the difference?**

  Effort and expectations

The Pygmalion Effect

- **In 1968, Robert Rosenthal of Harvard and Leonore Jacobsen, a San Francisco elementary school principal published a study of an experiment about the correlation between teacher's expectations and student achievement**
  - **All students in the elementary school were given intelligence tests**
  - **20% of the students were randomly selected to be labeled as "showing unusual potential for intellectual growth"**
  - **After 8 months these students showed greater increases on test scores than the students who had not been identified as having potential, despite actual equivalency in the previous test**
  - **The teachers reported certain behaviors - intellectual curiosity, happiness, self-esteem - were all higher in the group**

- ***Expectations beget achievement***

The Crisis Crisis

Things have gone to hell in this country if we don't have a good crisis to stimulate us. The alarm bells in many parts of Measuring Up have that familiar ring. When I was an undergraduate history major at Yale there was the standard apprentice historian's joke: In modern history there are two constants; the middle class is always rising and Spain is always falling.

In American education there is always a crisis. Noah Webster saw one in 1800, Emerson and Channing in the 1830's, Frederick Barnard in 1850, in the 1870's we were falling behind the Germans, in the 1890's immigration was overwhelming the schools, after the turn of the last century every decade has had its crisis of finance, enrollment (whether rising or falling), and quality.

What is the real situation today? We are at the end of a long secular trend in the rise of enrollment in percentage terms, the rise in real inflation-adjusted funding from all sources, and growth in graduation rates and academic success rates, especially for minorities.

The Crisis Crisis

We are faced with state and federal budget shortfalls of massive proportions because of the huge overexpansion of spending based on one time revenue gains (capital gains) in the nineties.

Minority academic achievement, academic success for low income and inner city residents, after rising dramatically has settled back to where it was at the beginning of the eighties in many cases.

The rhetoric of crisis is overblown for both the nation and Missouri. We can and should spend more money, graduate more people and focus more on the quality of our institutions.

The Collaborative has spoken of the Gap in "access to learning opportunities" if our goal is to prepare all Missourians "to live and work in the 21st century".

I agree. What we disagree on is where the problem can best be attacked. And it is an ongoing problem, not a crisis to be dealt with and overcome in a policy initiative.

Expand Access?

- **What do we do with the 300 graduates of Vashon in St. Louis and Central High in Kansas City? Or the 40 from Milan in Sullivan County)?**
  - **Remember the number 0**
  - **That is the proficient or above number for Central and Vashon**
  - **The number for Milan is 9.7**
- **Do we expand access for them at the community college level (20% of them are already going) or 4 year colleges (20% are already going):**
- **Do we give them more**
  - **Financial aid**
  - **Remedial courses**
  - **Guidance**
- **Or do we**
  - **Raise their proficiency levels**
  - **Give them better teachers**
  - **Offer better and more advanced courses**
  - ***Raise their expectations not their entitlements***

Expand Access?

- **I don't believe this is an either/or**
- **We should do both**
- **But in an era of restricted spending we should concentrate on what has the highest and best and most persisting benefit**
- **I believe that is based in teaching and curriculum in middle and high schools**

- **If we take unachieving and under prepared students from Vashon and Central and thrust them into colleges in greater numbers we will spend more on expensive remedial education, financial aid, and the higher overhead of college with increasing likelihood of failure the lower down we go in the academic proficiency scale. And that failure will be imprinted socially in all kinds of ways from self esteem to income foregone**

Missouri's To-Do List

What I advocate

- **Spend more money**
  - **Kindergarten through 12 and beyond**
  - **Reducing class sizes K-3**
  - **Pre-Kindergarten**
  - **Differential salaries for math and science teachers higher respectively in middle and high school)**
  - **Pay master teachers more money**
- **If budget realities preclude increases in spending I would do this by shifting spending, including raising class sizes, in upper grades.**
- **In higher education I would advocate**
  - **Assess the success in learning and in persistence and completion of what we are doing in all institutions P-16.**
  - **Connect the academic core curriculum through all levels P-16**
  - **Make available to everyone**

To-Do List (continued)

- **Improve teacher education by insisting on its relationship to the above by**
  - **Setting higher standards**
  - **Teaching more core curriculum content**
  - **Connect all teacher education programs to specific high schools**
  - ***Publicly* assess the success of every program**
  - **Focus financial aid on need-based students whose achievement in high school demonstrated the ability to succeed in college**
  - **Guide the core curriculum through traditional ideas of the liberal arts**
    - **The liberation of the citizen-ruler in us all**
    - **Create centers of excellence as the apex of aspiration for the state, that all achievement have a goal and a home**

The Long National Debate

- **You are witness to another chapter in the American debate on education. One of the greatest moments was played out on a national stage by Missouri actors in the late nineteenth and early twentieth centuries. William Torrey Harris was superintendent of the St. Louis School system. A philosopher, and a believer in offering general education based on the liberal arts to all, he became the first U.S. Commissioner of Education. He was a primary author and inspiration of the report of the Committee of Ten in 1893 which advocated a democratic opening of our academic curriculum to everyone. His great opponent was Calvin Woodward, professor at Washington University and the Pied Piper of vocational education, or manual training as it was then called. Though I am not sure what the specific remedies of the collaborative are today, I know that they are closer to Woodward's view of education as training for the work force, education a benefit of and for the economy. I represent more of a belief in academic excellence open to all—all who dare to achieve.**

The Long National Debate

- **Our argument centers on the importance of the core curriculum versus the importance of access.**
- **There is also a difference over the place of creativity and mastery.**
- **Gordon Davies has said "higher education creates knowledge" and through aid to entrepreneurs can create jobs.**

- I feel that higher education is about the mastery of a substantive body of work
- It is about the old fashioned idea of liberal education centered on the inheritance of
  - A body of knowledge
  - A way thinking about and
  - A working in that field
  - A discipline to be mastered
  - An introduction into the grammar and vocabulary of something developed in academies over the centuries or laboratories overnight.

The Liberal Arts

- The center is mastery of a discipline. English, math, the various sciences have been thought of as disciplines. They have their rules of engagement, their body of information, and to master it is to be initiated into mysteries and into a power and a fraternity that you will never lose. And the chief power is that of the concept of mastery itself—the ability to get hold of something whole, making it your own.

Math

- **The most important of these, as a discipline is Math, and of the aspects of Math–Algebra. When I asked members of the Collaborative what was the best predictor of academic success, Joni Finney unhesitatingly said "8th grade Algebra"**
- **When I asked you, the Commission, if anybody had used their Algebra this week, the answer was of course…no.**
- **And yet who will dispute the importance of this discipline? The mind that can think these problems through and solve them, learn the rules and processes, absorb the axioms, learn to solve new problems, and own a body of knowledge, is permanently empowered and earns independence.**

Foreign Language

- **Learning a foreign language does much the same thing. It opens a world to inhabit and to feed on forever**
- **It leads to stronger performance in other disciplines**
- **Students who complete four years of foreign language study score 100 points higher in each sector of the SAT than those who have 1/2 year or less**
- **This could be self selection bias: only the better SAT takers study foreign languages or take the test**

Or

- **It could be that those who take higher math, foreign languages, and other advanced courses commit themselves to learning, and learning at the level of mastery which leads to a disciplined engagement with the world.**

Regional Advantage, the Global Economy and Centers of Experience

- **The importance of centers of excellence in sustaining two things**
  - **There is no great city (or larger community) without a great university**
  - **Great research universities beget economic growth**
- **Annalee Saxenian reports in her book *Regional Advantage on the relative success of Route 128 outside Boston and Silicon Valley outside San Francisco***
  - **Her primary point is that the culture of cooperative and collaborative learning and shared goals led to a more sustained culture of technological advance in Silicon Valley than Route 128**
  - **In Silicon Valley - all levels of the community were interested in advanced learning: government, business, schools and universities, the civic infrastructure, the social world, even the bankers!**
  - **Route 128 in contrast was more isolated, competitive and closed**

Regional Advantage, the Global Economy and Centers of Experience

- **But underlying this excellent distinction is the point that the following areas are all based on two factors**
  - **Route 128**
  - **Silicon Valley**
  - **Research Triangle in North Carolina**
  - **Austin Technology miracle**
  - **Dulles Corridor in Washington, D.C. and Virginia**
  - **I-25 corridor through Colorado Springs, Denver and Boulder**
- **The development of a great university or university corridor**
- **A dynamic urban environment**

Centers of Excellence

- **Stanford created Silicon Valley, Harvard and MIT created Route 128, the University of Texas created the Austin Miracle.**
- **For many years Texas was a very big very rich university and Austin was a growing but unexciting capital city. Over the last twenty years Texas became a very big, very rich, very good university and Austin technology blossomed.**
- **Frank Rhodes, the recently-retired President of Cornell, came to Kansas City last month, and he said, "Cornell is a very good university but it will never be a great university because it is in Ithaca."**
- **And he said "Kansas City could have a great educational enterprise because it is a great philanthropic city."**

Centers of Excellence

- **But only if the institutions collaborated on creating *programs of excellence* focused on leadership in important fields such as the life sciences**
  - **The vision must be a long term commitment**
  - **The commitment must be to leadership and to excellence**

Centers of Excellence

- **To create centers of excellence for the 21st century**
  - **The Governor should appoint a task force to review the academic success of current programs**
  - **The economic leadership and needs of the state, e.g. Life Sciences and Engineering**
  - **To recommend between 6 and 12 programs for the state**
  - **The civic and institutional leadership, the business leadership of Missouri should make a long term commitment to:**
    - **Specific goals of private commitment leveraged by public dollars**
    - **Specific goals of academic achievement**
- **The best example of this would be the Life Sciences**

The Life Sciences

Missouri has underway one of the most significant academic resources and institutional partnerships in the nation - over seventy institutions have come together to pledge collaboration and support for making Missouri an international center for this research and development

- Washington University - home of the genome project
- Washington University Medical School - together they are fourth or fifth in research funding for the Life Sciences in the U.S.
- Danforth Plant Sciences Institute
- The University of Missouri - the Columbia campus is in the top 20 in NIH and NSF funding
- Stowers Institute in Kansas City - probably the nation's most significant addition to basic research in the last decade
- UMKC and other campuses
- Venture capitalists and business leaders in Kansas City and St. Louis
- Midwest Research Institute
- The Danforth Foundation
- The Ewing Marion Kauffman Foundation

Life Sciences - continued

- **The Batelle Report**
  - **Missouri has a comparative advantage in research**
  - **Our mature Life Science industries are declining**
  - **We are not investing enough at the state level**
  - **High paying jobs are migrating**
  - **Missouri is 12th in Life Science research funding**
    - **75% of that is Washington University**
    - **Danforth and Stowers will grow (pun intended) that number**
  - **Missouri had one year budget cycle with no planning for future investment**
  - **Missouri ranks low but is growing in venture capital**
  - **There are "silo's of effort"**

Life Sciences - Recommendations

- **The Life Sciences should be *the* demonstration project for creating centers of excellence in Missouri**
- **We should**
  - **Have a public /private commitment of funding over 10-20 years**
  - **Unite the major public and private institutions in both clinical and research applications**
  - **Authorize and fund through the Life Sciences Consortium**
  - **Direct funds to and by the programs with the greatest distinction, for example**
    - **Washington University in Genetics**
    - **University of Missouri Rolla in Environmental Engineering**
  - **Evaluate the University of Missouri Columbia hospital/medical program in light of the Life Sciences initiative**

Missouri Curriculum

Including a section to be required on U.S. and Missouri history and government, the literature of Missouri, the landscape and ecology of the state, the history of science, engineering, and agriculture in Missouri. Curriculum should include:

History

- The Native American heritage
- Lewis and Clark
- Jefferson Connection to Missouri
- The Trail of Tears
- Benton, Gilpin, Chouteau and the Opening of the West
- The Civil War

Literature

- Mark Twain
- T.S. Eliot
- Langston Hughes
- Laura Ingalls Wilder
- Tennessee Williams

Engineering

- The Eads Bridge
- The Arch
- The Sports Stadium Design

Science

- The discovery of the energy transfer molecule
- The Genome Project

Ecology

- The river system
- The prairie system

Governance

- **Aims McGuinness of the Collaborative wisely said that governance was likely to be a distraction from the real business of reform. It does not in and of itself guarantee change or movement and it is fraught with political consequences. Therefore it is certain to engage political opposition**
- **Having said that, I also was stimulated by Ed Douglas and Charlie Shields in their comments on governance. And I believe that the essential accountabilities for a reform that covers 4 year curriculum, 2 year curriculum, teacher education and the core curriculum of our secondary schools must be in one place and one person**
- **Missouri, Kansas City and St. Louis are all the legatees of a system left over from the era of the Butler and Pendergast machines which left power in boards and commissions of limited authority and scope and subject to dominance by department professionals, balkanized power centers and Byzantine processes**

Governance

- **To accomplish the reforms outlined I would propose a cabinet level secretary of education reporting to the governor, with an advisory panel of four college presidents, two high school principals, rotating periodically and including private schools and six citizen representatives from diverse backgrounds but always to include at least one member from Kansas City and St. Louis and a premium on intellectual and civic and moral-distinction: Real Leaders**
- **The Commissioners of Education and Higher Education would report to the Secretary. The Coordinating Board and the State Board of Education would be abolished. Accountability for all Missouri education would be centered in one place**

Assessment

- **In Missouri, going back to Charles McClain's tenure at Truman State and as commissioner of higher education, we have had a nationally-admired assessment program. We need to universalize this and connect it to the sporadic efforts we have made in K-12**
- **We must now universalize that under the auspices of *No Child Left Behind* anyway**
- **We then need to connect this assessment to teacher training**
- **It must be based on evaluation of content and real measures of learning. NAEP and the ACT have made a good start here. Truman State and others are under way. This should not be hard**
- **The ACT 16-unit core in high school and the 42-unit core in college should be included and tracked in longitudinal ways**

Assessment

- **Every institution in the state should publish an easy to understand Annual Report or 10K (to use a business analogy) which would include:**
  - **Scores on normed tests**
  - **Graduation rates**
  - **Per pupil expenditures**
  - **Teacher-Student ratios**
  - **Administrative costs**
  - **Matriculation and placement**
- **This should be available**
  - **On the web with one click**
  - **Easily accessed in every school**
  - **Published in the major newspapers**
- **Teacher training programs should follow the academic progress of their teachers, with those teachers' students and classes**

Financial Aid

- **We all agree: We must simplify our student aid programs**
- **Recommendations of the 1999 Missouri Commission on the Affordability of Higher Education for two programs**
  - **One for merit**
  - **One for need**
- **I would advocate the following:**

  ***One* program *combining* need and merit**

Financial Aid

- **Risks**
  - **Need based programs - risk of losing good students to out-of-state**
  - **Merit-based programs - that low scoring/low GPA students who need and would use the boost of a college education would be denied**
  - **It's worth the risks if we give a hand up to those best able to make use of a college education**
- **Further, let us focus this program on the transition moments**
    - **The first year of college – 4-year or 2-year**
    - **The third year transfer student from community college to 4-year college or university**
- **These are the moments when new requirements and effort are required and we should ease the transition for students in need**

Recommendations on Cost, Achievement and Financial Aid

- **FAB - <u>Family Achievement Bonus</u>**
- **Structured as grant or Tax Credit or forgiveness of student loan, perhaps in ascending magnitude**
- **$1,000 (avg.) payable to the family of anyone who can pass, at a level exceeding the average, a Missouri Skills Test, that would test the core curriculum**
  - **English**
  - **Science**
  - **Math and advanced math—algebra, geometry, pre-calculus, calculus, advanced algebra**
  - **History**
- **At any time after age 17**
- **Payable to family—mother. father, legal guardian**
- **$1,500 if graduating from a school below the state average**

Reprise—the Recommendations

- **Assessment at all levels**
  - **A 10K for every school and every higher education program**
  - **Assess real learning**
  - **Assess the effect of the curriculum**
- **Universalize the Core Curriculum**
- **Connect the Core at all Levels**
  - **Teach the core at 2 and 4 years**
  - **Teach the teachers the core**
- **Financial Aid Redirected to Need/Merit**

Reprise—the Recommendations

- **Create a Secretary of Education**
- **FAB - Family Achievement Bonus**
- **TAB - Teacher Achievement Bonus**
- **Shift Funding from the Institutions to the Student**
- **A State commitment over 20 years of $100 million (only $5 million a year) to leverage $200 million in private money for endowed chairs in five to six programs in the state including**
  - **Life Sciences - St. Louis/KC**
  - **Engineering - Rolla/KC**
  - **Honors Program - Columbia**
  - **Agriculture School - Columbia**
  - **Honors Colleges - other campuses**
- **Create a portion of the Liberal Arts Core Curriculum that celebrates the heritage of Missouri**

I would propose to the Governor that we create task forces on each of these issues

Commission on the Future of Higher Education in Missouri

November 10, 2003

R. Crosby Kemper III, Chairman